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HARD CHOICES

A Report on the Increasing Gap Between America's Infrastructure Needs and Our Ability To Pay for Them

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Appendix 16. NORTH CAROLINA

A CASE STUDY

PREPARED FOR THE USE OF THE

SUBCOMMITTEE ON ECONOMIC GOALS AND INTERGOVERNMENTAL POLICY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

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Preface

Infrastructure problems are widespread. They do not respect regional or state boundaries. To secure a better data base concerning national and state infrastructure conditions and to develop threshold estimates of national and state infrastructure conditions, the Joint Economic Committee of the Congress requested that the University of Colorado's Graduate School of Public Affairs direct a twenty-three state infrastructure study. Simultaneously, the JEC appointed a National Infrastructure Advisory Committee to monitor study progress, review study findings and help develop policy recommendations to the Congress.

In almost all cases, the studies were prepared by principal analysts from a university or college within the state, following a design developed by the University of Colorado. Close collaboration was required and was received from the Governor's staff and relevant state agencies.

Because of fiscal constraints each participating university or college agreed to forego normal overhead and each researcher agreed to contribute considerable time to the analysis. Both are to be commended for their commitment to a unique and important national effort for the Congress of the United States.

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NORTH CAROLINA INFRASTRUCTURE STUDY:

TRANSPORTATION, EDUCATION, WATER AND SEWER

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July, 1983

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INTRODUCTION

The purpose of this study is to provide a description and analysis of public infrastructure needs in North Carolina in four major areas--transportation, water supply, wastewater treatment, and education. It examines the state's record of expenditures in these areas, provides a description of the present conditions, estimates the capital improvement requirements for the state between now and the year 2000, and compares these estimated costs with projections of sources of funds.

The study is both a report to the North Carolina Department of Natural Resources and Community Development and one of nineteen state studies being coordinated by the Center for Public-Private Sector Cooperation, Graduate School of Public Affairs at the University of Colorado at Denver. The latter study is being sponsored by the Joint Economic Committee of the U.S. Congress, among others, to assess the dimensions of the public infrastructure problem in the United States.

The methods used in the study provide a preliminary assessment of the scope of the public infrastructure problem in the state of North Carolina. Lacking time, funds and an established methodology for a definitive investigation, the study is based on available state, federal and local reports and other information provided by state agencies, supplemented with interviews with knowledgeable officials. The study provides a

concise history of capital spending in the state and a quantitiative estimate of public capital spending needs over the remaining eighteen years of this century. An attempt is also made to project revenue sources to meet these needs and to estimate the "infrastructure gap." The spending and revenue estimates are inclusive of local governments as well as state government, and include all funding sources, including federal grants. It should be emphasized that all estimates are subject to the usual hazzards of long range forecasting, aggrevated by the reliance on scattered sources of available information, but the authors judge that the study provides a good indication of the magnitude of projected needs, revenues and the gap between the two for North Carolina.

Projections of expenditure needs, revenues, and revenue-needs gaps are expressed in 1982 dollars. Past expenditures and revenues in the text and tables are expressed in the dollars of the years to which they pertain. Whenever figures from past years were used to estimate trend lines for projections, however, they were first converted to 1982 dollars. Generally, least squares regression was used in calibrating trend lines, although averages of past figures were used if no perceptible trend was present.

The report is organized in six chapters. Chapter I describes the demography, economy, geography and governmental organization of the state and reviews trends and makes projections for population, employment, capital spending, and revenues. It provides the big picture. Chapters II, III, and IV

focus on transportation, water supply, and wastewater in that order. Each chapter follows roughly the same outline--trends in spending for capital improvements and their maintenance, descriptions of existing conditions, estimates of capital investment required to meet present and future needs to the year 2000, estimates of prospective sources of funding to meet capital infrastructure needs, gaps between needs and prospective funds, constraints to governmental actions to narrow the gaps, and policy options being considered to address the need for capital investments. A final chapter V summarizes the findings of the study and presents conclusions.

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CHAPTER I

A DESCRIPTION OF THE STATE: CURRENT, PAST AND FUTURE

This chapter provides a background of demographic, economic, geographic, and fiscal and political information about North Carolina. Such information is useful for an understanding of the state's infrastructure needs and potential options for addressing those needs, as well as for comparing North Carolina to other states.

The first section of the chapter describes the size and composition of the state's current population, as well as trends and projections. The second section provides similar information about the state's economy and employment. Next, in the third section, important regional variations in physical geography, culture, population characteristics, and economy are described; variations that divide the state into several distinct regions. A description of the state and local government in North Carolina then follows in the fourth section, emphasizing those characteristics that are unique to the state and bear on public infrastructure decision making. This discussion includes a review of past capital investment expenditure, as well as prospects for the future. A concluding section summarizes the data presented in the chapter and their implications for public capital infrastructure in North Carolina.

Major sources of information are identified at the beginning of each section. Readers already familiar with North Carolina and its government may wish to proceed directly to Chapter II, perhaps first skimming the sections on population, employment,

and fiscal prospects as well as the conclusion.

Population

Characteristics of North Carolina's Population

(The primary source of information for this section is the Office of State Budget and Management's May, 1982 NC State Data Center Newsletter, Vol.4, No. 2; and the Summary Tape File 3A of the Census of Population and Housing, NC Data Center, Office of State Budget and Management.)

There were 5,881,766 North Carolinians on April 1, 1980, according to the U.S. Census, making the old North State the tenth most populous state in the nation. The 1983 population is estimated to be 6,139,720.

While the population increased 15.7 percent in the 1970s, the number of households increased 35 percent. Average household size decreased from 3.24 in 1970 to 2.78 in 1980 and the number of one person households doubled from 200,840 in 1970 to 407,650 in 1980. The total number of households in 1980 was 2,043,291, including 1,576,622 families.

Fifty-two percent of North Carolina's population live in nonurban areas, which makes it the fifth most rural state in the nation.

Seventy-six percent of the population are white, 22 percent black, and one percent American Indian. North Carolina is one of five states in which blacks constitute more than one-fifth of the

population.

The population has been aging in North Carolina, as in most states. The median age in 1980 was 29.6, 3.1 years older than in 1970. One hundred thousand fewer persons under age 18 and 200,000 more persons aged 65 years and over were reported in the 1980 census than in 1970. The young labor force group, aged 25-34, increased too, however, by 50 percent.

Owner-occupied housing comprises 68 percent of the total 2,043,291 occupied dwellings in 1980. Sixty-seven percent of the state's housing is outside of urban areas. Almost ten percent of the year-around occupied units are mobile homes. Their number grew 150 percent from 87,000 in 1970 to 217,000 in 1980.

The average dwelling unit value reported by owners in 1980 was $41,751; average rent was $145 per month. The quality of housing as measured by the presence of adequate plumbing facilities, improved substantially during the 1970s. The number of year-around housing units lacking complete plumbing facilities dropped 54 percent from 252,000 in 1970 to 116,000 in 1980.

North Carolina is not a wealthy state. It ranks 44th among states in per capita income ($6,177), 42nd in household income ($14,876), and 37th in proportion of families below the poverty level (11.2 percent in 1979 and increased dramatically since then). Per capita income in 1980 was 82 percent of the U.S. average, the same ratio as existed in 1970.

Table I-1 summarizes selected characteristics of North Carolina's population.

TABLE I-I

CHARACTERISTICS OF NORTH CAROLINA'S 1980 POPULATION

Indicator	Statistic	Comment
Population level, 1980	5,881,766	
Population level, 1983 (estimated)	6,139,720	
Average household size (persons per household)	2.78	
Per capita income (dollars per year)	$6,177	44th among the states
Percent black	22%	one of 5 states over 20%
Percentage living in urban places	48%	fifth most rural state
Median years of education (1983)	11.3	
Population density (persons/square mile)	111.58	

Source: Office of State Budget and Management, May 1982, N.C. State Data Center Newsletter, Vol. 4, No. 2: and the "Summary Tape File 3A of the Census of Population and Housing," N.C. Data Center, Office of State Budget and Management.

Population Trends and Projections

(This section paraphrazes the NC2000 report draft, the Commission on the Future of North Carolina. It is based on work by the state's Office of State Budget and Management, Research Section.)

As part of the sunbelt, North Carolina experienced relatively large growth in population during the decade of the 1970s. The state's population grew at a rate of 15.7 percent, faster than during any period since the 1920s and faster than the national rate of 11.4 percent. From 5.1 million people in 1970, the state's population rose to 5.9 million in 1980. (See Tables I-2 and I-3.)

Projections of the state's population for the next two decades have been made by the U.S. Bureau of Economic Analysis, the U.S. Bureau of the Census, and the North Carolina Office of State Budget and Management. These projections are displayed in Tables I-2 and I-3.

During the 1980s, the state's population is expected to increase by 10 percent to 14 percent. Estimates vary depending upon the number of factors considered and assumptions made. Commerce's Bureau of Economic Analysis projects that by 1990 North Carolina's population will grow to 6.4 million, based on a mathematical model that makes assumptions about economic development and employment patterns. The state's own projection is approximately the same -- just under 6.5 million using methods that include only demographic data about fertility, life expectancy, and migration, Commerces's Bureau of the Census forecasts the state's population to rise to around the 6.7

TABLE 1-2

POPULATION STATISTICS

Area	1960	1970	1980	1983	1990+	2000+
North Carolina	4,556,155	5,084,411	5,881,766	6,139,720	6,445,000[1] 6,676,000[2] 6,493,000[3]	6,871,000[1] 7,340,000[2] 7,005,000[3]
South*	54,973,113	62,813,000	72,037,000	-	81,036,000[3]	94,836,000[1]
United States*	179,323,175	203,306,000	226,545,805	-	243,004,000[2]	265,608,000[1] 259,869,000[2]

TABLE I-3

POPULATION GROWTH RATES

	1960-1970	1970-1980	1980-1990+	1990-2000+
North Carolina	11.6%	15.7%	9.6%[1] 13.5%[2] 10.4%[3]	6.9%[1] 9.9%[2] 7.9%[3]
South*	14.0%	19.3%	14.6%	10.7%
United States*	13.3%	11.4%	9.5%	6.9%

* Including North Carolina
\+ Projected
[1] U.S.Bureau of Economic Analysis
[2] U.S. Bureau of the Census
[3] N.C. Office of State Budget and Management (as of May 1983)

Source: Office of State Management and Budget

million level by 1990. If current trends continue, we can expect the growth rate to 1990 to lag behind that of other sunbelt states and exceed the national rate.

During the final decade of this century, population growth in North Carolina, as well as the South and the U.S. as a whole, is expected to slow. The Bureau of Economic Analysis forecasts a gain of 7 percent in North Carolina's population from 1990 to 2000. A higher rate, 10 percent, is projected by the Bureau of the Census. The state's Office of State Budget and Management projects a gain of 8 percent. North Carolina's growth during that decade is expected to lag slightly behind the pace of the rest of the South and to slightly exceed the national rate. If these projections accurately bracket the actual future population growth, the state will have between 6.9 and 7.3 million residents as the present century ends and the 21st century begins. In other words, from 1980 to 2000, we can anticipate that the state's population will increase by 17 to 25 percent. translating to an additional one to two million persons that will require governmental services and public infrastructure. If household size at the turn of the century remains about what it is today (2.78), then we can expect to have to accommodate an additional 350,000 to 700,000 households.

It should be pointed out that these projections should be regarded with some caution. Both econometric and demographic projection methods base their projections upon past trends. When the future does not mirror the past, obviously the projections do not turn out to be accurate. For example, the U.S. Bureau of Census' projection of North Carolina's growth between 1975 and

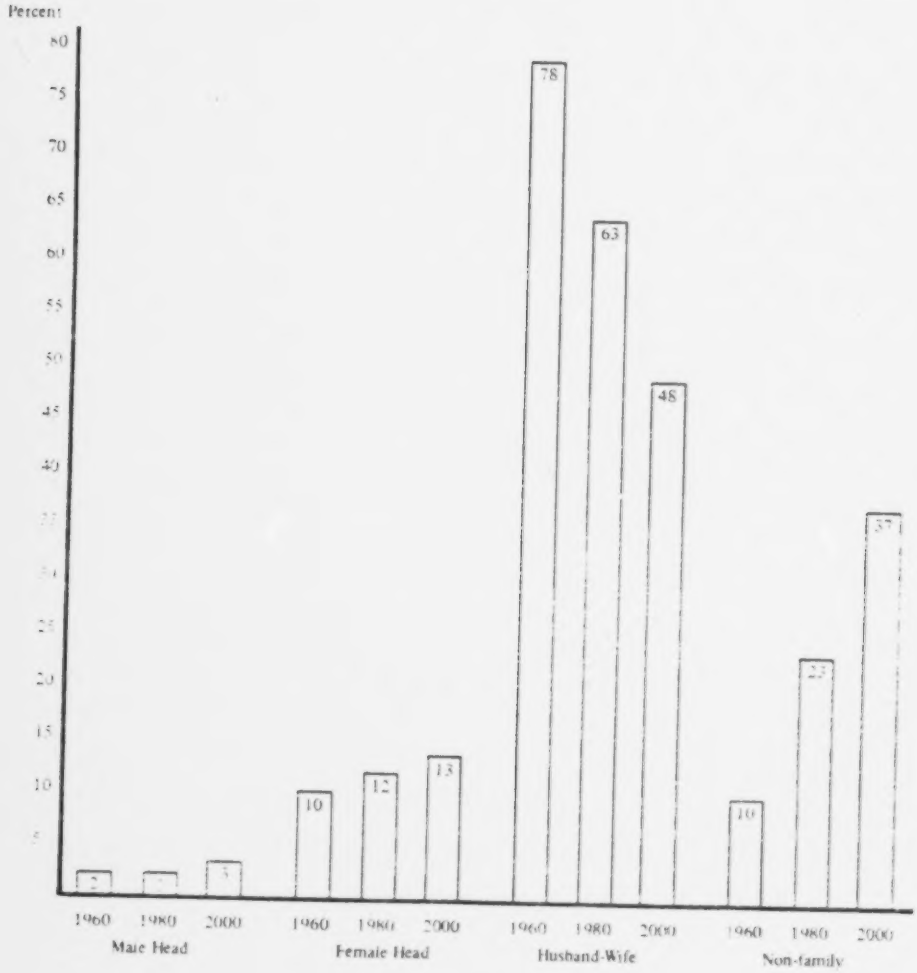
1980 fell short by 31 percent because migration turned out to be much higher than the previous rates on which the projection was based. And that 31 percent error was for only a five year period, compared to the 18 year period from now to the year 2000.

In addition to changing size, the state's population is expected to undergo substantial change in its composition by the year 2000. These structural changes could increase the need for services and infrastructure faster than the rate of population growth.

One of the population characteristics with the most significant implications for public infrastructure will be the average household size and the composition of types of households that make up the year 2000 population. Figure I-1 indicates that the relative percentage of households headed by both husbands and wives is forecast to deline from 63 percent to 48 percent. At the same time, the proportion of nonfamily households, that is, households consisting of unmarried persons without children, will increase from 23 percent to 37 percent by 2000. If these two projections combine with decisions to have few children so that the average family size stays small or gets smaller, the population's demand for housing and for water, sewer, and highways to service that housing will increase faster than the rate of population increase.

Age composition is another characteristic of the population with potentially significant implications for infrastructure needs. A significant increase in the proportion of citizens aged 65 and older and a corresponding decrease in the relative numbers

Figure I-1
Types of Households in North Carolina

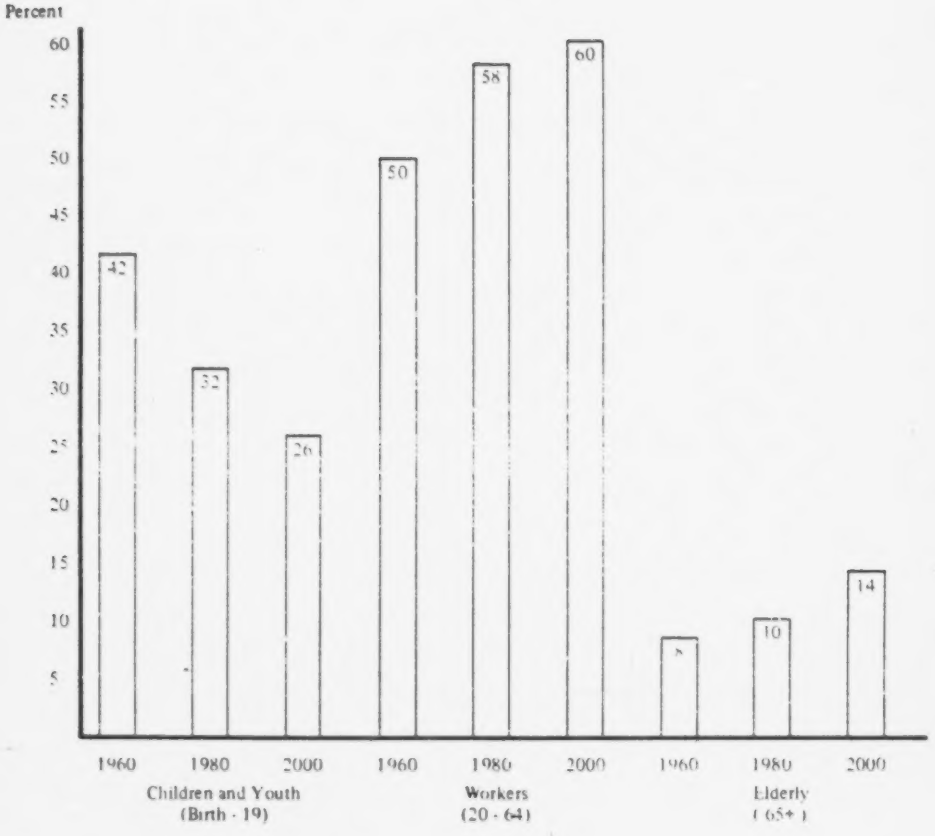


Source: Office of State Management and Budget

of children and youth are expected by the year 2000. As figure I-2 shows, the percentage of population 65 and older is projected to grow from 10 percent in 1980 to 14 percent in 2000. The percentage of children and teenagers is projected to decline from 32 percent in 1980 to 26 percent in 2000. These changes in composition of the state's population will have implications for public investment needs in public education facilities and housing, medical, and other facilties for the elderly.

There is a third factor that will increase the need for infrastructure faster than the population growth. The trend toward increased urbanization in North Carolina is expected to continue to the end of the century. The state's population is expected to be more concentrated in urban areas, especially in the Piedmont region, and thus require more urban infrastructure than if the state maintained its present more rural, low density population distribution.

Figure I-2
Composition of North Carolina Population by Age Group



Source: Office of State Management and Budget

The Economy

Characteristics of the Current Economy

(The primary source of information for this section is the Employment Security Commission of North Carolina, May 1982, Annual Planning Information: Fiscal Year 1983; and Bergman and Goldstein, 1983, "North Carolina: Diversification Slowed by Recession," Economic Review, Federal Reserve Bank of Atlanta, pp. 68-74.)

In 1980, employment was 2,669,000 of which only 3 percent was agricultural, 87 percent was nonagricultural wage and salary, and 10 percent was other nonagricultural employment. The figures change little for 1983. Table I-4 summarizes employment data for the state for 1980 and 1983 (projected).

North Carolina's economy remains heavily oriented toward manufacturing, even as services, trade, and government increase in size and importance. The state is also among the top three in the proportion of employment accounted for by manufacturing. About thirty percent of the nonagricultural wage and salary emploment is in manufacturing, as shown in Table I-4, down from nearly 40 percent in 1972, but still much higher than the 22.4 percent figure for the U.S. as a whole. (Bergman and Goldstein, 1983, p.72)

"Much of the state's manufacturing is tied to the homebuilding and automobile industries. Furniture, textiles and

TABLE I-4

EMPLOYMENT DISTRIBUTION IN NORTH CAROLINA AND THE U. S.

Category of Employment	1980		1983	
	Number	Percent of total	Number	Percent of total
Total Employment	2,669,000	100%	2,718,300	100%
Agricultural	86,000	3.2%	70,300	2.6%
Non-Farm Total	2,583,000	96.8%	2,648,000	97.4%
Non-Farm Wage & Salary by place of residence	2,318,000	86.8%	2,384,100	87.7%
Non-Farm Wage & Salary by place of employment	2,385,200	89.4%	2,385,100	87.7%
Manufacturing	824,200	30.9%	817,100	30.1%
Non-manufacturing	1,561,000	58.5%	1,562,000	57.7%
All other non-farm	265,000	9.9%	263,900	9.7%

Source: Employment Security Commission of North Carolina, (May 1982), Annual Planning Report, Tables 9, 10, 11.

related producer goods manufacturers are tied in to construction. Specialized textiles and suppliers of rubber and plastics and other motor vehicle supply firms depend upon sales to automobile manufacturers." (Bergman and Goldstein, 1983, p.69)

The state's recruiting of high-technology industries centers on the microelectronics industry. Within the last several years, a number of national firms, including General Electric, have announced major investments in research facilities and production plants in the state. The state's Research Triangle Park reputedly came in second to Austin, Texas in the recent locational decision of the Microelectronics Computer and Technology Corporation to build a major research facility.

The state's primary agricultural crop is tobacco. North Carolina currently grows two-thirds of flue-cured and four-tenths of all U.S. tobacco, of which $2.5 billion worth is exported annually. (Bergman and Goldstein, 1983, p.69)

Manufacturing wages are often used as a measure of economic well-being. The average manufacturing wage in North Carolina climbed from 68 percent of the national average in 1960 to 74 percent in 1980. However, average manufacturing wages still rank the lowest of any state in the nation. Fifty-five percent of the state's total manufacturing employment remains in the four sectors where wages are the lowest--apparel, lumber and wood products, furniture, and textiles. The comparable figure for the nation is only 16 percent.

The wide differences in the state and national occupational employment distributions is illustated by the national proportion of professional, technical, and service workers which is more

than a third greater than North Carolina's proportion and the state's proportion of operatives (truck drivers, machine operators, etc.), which is more than 60 percent larger than in the nation. Professional, managerial, and skilled technical workers are expected to constitute an increasing share of future employment in North Carolina as they are in the nation.

Economic Trends and Projections

(This section is based on several sources: the NC2000 Report; the Employment Security Commission of North Carolina, Annual Planning Report, May 1982; employment forecasts supplied by the Office of State Budget and Management originally prepared in January 1982 for the NC 2000 Economy Panel; forecasts of personal income supplied by the State Office of Management and Budget to the authors; and Bergman and Goldstein, "North Carolina: Diversification Slowed by Recession," Economic Review, published by the Federal Reserve Bank of Atlanta, February 1983.)

North Carolina experienced employment growth faster than the nation in the 1960s and 70s and is expected to grow faster than the nation through the year 2000. At the same time the average annual rate of growth has declined steadily from 4.1 percent in the 60s to 3 percent in the seventies, to a projected 2.4 percent in the 80s and 1.5 percent in the 1990s.

Trends and projections of nonfarm employment are shown in Tables I-5 and I-6. Agricultural employment is not included. However this is not a serious omission since it is such a small

TABLE I-5

NORTH CAROLINA
TOTAL NONFARM EMPLOYMENT
PROJECTED 1981-2000

Year	North Carolina Total Nonfarm Employment (000)
1960	1,195.2
1965	1,426.0
1970	1,782.9
1975	1,979.2
1980	2,385,5
1985	2,677.9
1990	3,012.6
1995	3,253.2
2000	3,506.4

Source:

Office of State Budget and Management
January, 1982

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Table I-6

Distribution of
Total Nonfarm Employment

Sector	1960		1970		1980		1990		2000	
	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.
Manufacturing	31.0	42.6	27.3	40.3	22.4	34.6	20.7	32.7	18.8	30.6
Mining	1.3	0.3	0.9	0.2	1.1	0.2	1.2	0.2	1.1	0.1
Contract Construction	5.4	5.5	5.1	5.4	4.9	5.0	5.3	4.9	4.9	4.4
Transportation, Communication, and Public Utilites	7.4	5.4	6.45	5.2	5.7	4.9	5.2	4.8	4.9	4.8
Trade	21.0	18.4	21.2	18.2	22.5	19.8	22.9	20.8	23.1	21.3
Finance, Insurance, and Real Estate	4.9	3.5	5.1	3.9	5.7	4.0	6.2	4.2	6.4	4.4
Services	13.6	10.6	16.3	12.0	19.8	14.3	22.4	16.2	23.6	17.4
Government	15.4	13.7	17.7	14.8	17.9	17.2	16.1	16.2	17.2	17.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Office of State Budget and Management, January 1982.

proportion of total employment and has declined in the 1970s from approximately 6 percent of total employment at the beginning of the decade to about 3 percent by decade's end. Also, Table I-4 has figures for agricultural employment as well as nonfarm employment for 1980 and 1983. As Table I-5 shows, nonfarm employment is projected to go from 2.4 million in 1980 to 3 million by 1990 and 3.5 million by the year 2000. In the process, the structure of the state's economy will change and become more nearly like the national economy. By examining Table I-6, one can see that manufacturing employment, for example, has already dropped from 40.3 percent of the total nonfarm employment in 1970 to 34.6 percent in 1980 and is projected to be only 30.6 percent in the year 2000. While moving toward the national average, the state has had and will continue to have a higher percentage of employment in manufacturing that the U.S. as a whole.

The textile, tobacco, and food products sectors of manufacturing, long predominant in North Carolina, are expected to actually decline in employment between now and the end of the century, along with the primary industries of agriculture, forestry, fishing and mining. Trade and services sectors, on the other hand, have been on the rise and are projected to continue to increase their proportion of total employment.

The major growth will likely be in business and financial services, (especially information processing), recreation services, electronics, chemical and medical technology, and local and state public services. The two major forces will be new capital investment and the adoption of new labor-saving

technology to increase productivity. Adequate public infrastructure and a sound program for maintaining and expanding it will be a factor influencing these major private sector investment decisions.

There has been a trend since 1978 toward higher rates of employment growth in metropolian areas than in nonmetropolitan areas of the state. Metropolitan areas seem to have fared much better with respect to unemployment rate over the past five years as well. Still, North Carolina's nonfarm employment is not as concentrated in a few centers as in many other states. In 1970, for example, employment was about evenly split between metropolitan and nonmetropolitan counties. In 1980, 60 percent of employment was in the metropolitan counties.

Per capita income trends and projections are shown in Table I-7. After dramatic gains in the 1960s, North Carolinians are expected to gain only slightly in their personal incomes, relative to the rest of the country, going from 80 percent of U.S. per capita income in 1980 to 83 percent in the year 2000.

Projections of total personal income for North Carolina (probably the most useful single factor in projecting state revenues, though certainly not the only one) are shown in Table I-8. These projections indicate annual growth of real personal income in the three percent range.

TABLE I-7

PER CAPITA INCOME
(DOLLARS)

	1960		1970		1980		1990		2000	
	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.	U.S.	N.C.
Per Capita Income	2,222	1,561	3,954	3,200	9,711	7,785	23,072	19,261	48,569	40,378
%of U.S.	-	70.3	-	80.9	-	80.2	-	83.5	-	83.1

Source: Office of Budget and Management, January, 1982.

TABLE I-8

PROJECTED
NORTH CAROLINA PERSONAL INCOME
($ BILLIONS)

YEAR	PERSONAL INCOME	REAL PERSONAL INCOME (1982 $)
1982	53.98	53.98
1983	58.23	55.27
1984	63.76	57.51
1985	70.00	59.88
1986	77.00	62.41
1987	84.67	64.85
1988	93.29	67.26
1989	102.61	69.65
1990	112.11	71.61
1991	122.93	73.86
1992	134.47	76.15
1993	146.60	78.29
1994	159.67	80.44
1995	173.92	82.72
1996	190.32	85.51
1997	208.07	88.37
1998	227.20	91.22
1999	247.99	94.15
2000	270.69	97.18

SOURCE: ADAPTED FROM OFFICE OF STATE BUDGET AND MANAGEMENT

The Physical, Cultural, Economic, and Demographic Geography

(Footnote: Major sources of information for this section of the report are the North Carolina Atlas: Portrait of a Changing Southern State, edited by Clay, Orr and Stuart in 1975; and the "Annual Planning Information: Fiscal Year 1983," prepared by the Labor Market Information Division, Employment Security Commission of North Carolina in May of 1982.)

North Carolina's 52,712 square miles ranks 28th among the states in land area. From Virginia on its northern border, North Carolina extends vertically only 100 to 140 miles to its southern neighbor, South Carolina. From east to west, however, the state's varied geography stretches 500 miles from the Atlantic Ocean to a mountainous border with Tennessee. It divides into three very distinct physiographic regions--the coastal plain, the piedmont and the mountains. Each region has a particular set of soil, drainage, and climatic conditons. As early settlers funneled into each area, human variances began to match the diversities in the physical landscape. Thus, the three geographic divisions are more than merely physical. Each region developed its own human imprint and the three became contrasting cultural regions as well as physically distinct. North Carolina is therefore often perceived by its citizens, and analyzed by scholars, along these regional distinctions, sometimes to the extent of being characterized as three states within the one state.

The Coastal Plain. The Coastal Plain begins with a string of sandy barrier islands called the Outer Banks. Just inland is

a tidewater area strongly affected by ocean tides in its rivers and sounds and comprised of marshes, swamps, and treeless savannas. Generally the land there is very flat and poorly drained. The inner Coastal Plain, however, has arable soil, easily cultivated land, and favorable climate that provides a long growing season.

There is a strong agricultural tradition in the coastal plain and agriculture still provides a large part of the econmic base. Over half of the state's agricultural workers are employed in the region. However, the coastal plain economy is becoming more industrialized and the population increasingly "rural-nonfarm" as more and more people commute from their rural homes to the nearest industrial plant. The average farm size is increasing dramatically with the advent of "superfarms" and mechanization generally.

The 31 counties of the Coastal Plain include about 45 percent of the land area of the state, but less than one-third of its population. Currently one-fifth of the state's manufacturing workers are employed in the region. Only two of the state's ten major cities--Fayetteville (1980 population of 59,507) and Willmington (1980 population of 44,000 and declining)--are in the region. It is North Carolina's "Old South".

<u>The Piedmont Region.</u> The Piedmont rises from a fall line some 100 to 140 miles inland of the coast and continues to the Blue Ridge scarp which rises abruptly 1500 to 2500 feet. Physically, the Piedmont is characterized by small farms and woodland and has a rolling topography, cut sharply by swift-moving streams that became choice sites for the early

textile mills dependent on water power. If the coastal plain is associated with the old south, the Piedmont is more closely identified with the "New South".

Two-thirds of the state's urban centers are located in the Piedmont with seven of the ten largest cities. Charlotte, the largest city in either North or South Carolina and a major southeast regional finance and distribution center, is here as well. So is the state's capital, Raleigh. These two cities form the two ends of an elongated, curved urban area, called the Piedmont Urban Crescent. Apart from the crescent, the Piedmont is characterized by many small and medium-sized urban centers and an evenly spread population distribution.

North Carolina's leading manufacturing industries, educational facilities, and trade centers are in or adjacent to this region. Over 60 percent of the state's manufacturing employees are employed in the Piedmont, primarily in the dominant industries of textiles, furniture, and machinery. The state's major finance and commerce centers are found in the major cities of this region.

The region contains 34 percent of the state's land area, 54 of the state's 100 counties, and 54 percent of the state's population.

The Mountain Region. North Carolina's picturesque Mountain Region is part of the long Appalachian chain that runs from Canada to Alabama. It includes the Blue Ridge and the Great Smokies, and has been called the roof top of eastern North America. Over forty mountain peaks rise above six thousand feet in elevation, including the 6,684-foot Mount Mitchell, the

highest peak east of the Mississippi River. In its sheltered valleys and coves developed yet a third relatively distinct culture of the mountain people, fiercely independent and isolated.

Today, the region consists of 25 mostly sparsely populated counties, holding 15 percent of the state's population. Asheville is the only major city, but the region is becoming increasingly developed in recent years as a recreational and retirement area.

An Urbanization Anomaly: Rural and Low Density Urban Population Combined with a High Level of Industrialization

North Carolina combines a highly industrialized economy (usually associated with a high degree of urbanization) with a predominantly rurally located population (usually associated with an agricultural economy).

Even though North Carolina's population went from 45 percent urban in 1970 to 48 percent urban in 1980, it is still fifth from the bottom in the nation in percent urban population.

Even North Carolina's urban population live in smaller cities than what characterizes the rest of the nation. That is, less of the state's population live in large cities and the state's cities are generally small or middle-sized. To illustrate, no North Carolinian lives in an urbanized area over 500,000. And, while for the nation, nearly half of the

population resided in urbanized areas of 250,000 or more in 1970, in North Carolina only 5.5 percent did.

Partly because of their size, North Carolina cities tend to have low population densities. Of the 138 urban places in the state, only 13 have densities above 3000 persons per square mile and only one of the ten largest cities had a density over 2500 persons per square mile in 1970.

However, in spite of its low level of place-oriented urbanization and the sparcity of large cities, North Carolina is a very highly industrialized state. Industrial employment was 88 percent of total employment at the end of 1981; about one-third of that in manufacturing. (See Table I-4 above.)

North Carolina may be on its way to losing its urban anomaly character, however. The fourteen "urban" counties of the state, largely metropolitan and in the Piedmont industrial region, are developing distinctly higher income and educational attainment. Also, whereas manufacturing generally tends to be spreading across the state and to be specialized and low-wage, in the urban areas, industry is increasingly diversified and higher wage. Retailing is also increasingly concentrated in these urban centers. In other words, there is a snowballing concentration of people and economic activity in these urban centers. Furthermore, Bergman and Goldstein (1983) found that although metropolitan and nonmetropolitan employment experienced roughly parallel swings in employment of comparable magnitude from 1970 to 1978, in the following two years and continuing into the recent recession, the two trends diverged sharply. Employment continued to grow rapidly in metropolitan areas, but dropped

sharply in nonmetropolitan areas. The urban counties generally will have the greatest requirements for public works over the next two decades.

Governmental Structure and Fiscal Characteristics

(This section is based primarily on information in David M. Lawrence and Warrren J. Wicker, editors, Municipal Government in North Carolina, The Institute of Government, The Unviversity of North Carolina at Chapel Hill, 1982; NCINSIGHT, Dec. 1981; and Summary of Recommended State Budget: 1983-1985.)

Governmental Structure

The General Assembly, the legislative branch of state government, is composed of the 50-member Senate and 120-member House of Representatives. Among its functions is the provision and allocation of funds, including those for capital improvements. The General Assembly meets on a biennial basis, a budget being adopted for each biennium. In recent years the General Assembly has met annually for the purpose of reviewing the state's budget and financial conditions.

In the executive branch of the state government the Governor, elected for a four-year term, is the chief officer. He functions as director of the budget, with responsibilities for all phases of budgeting. The roles of various state agencies in the executive branch, with respect to the capital improvements studied in this report, are described in the chapters on specific categories of capital improvements.

The state has no coordinated capital improvement planning, although individual agencies and commissions have done limited planning. There is no systematic long range projection of capital investment needs or of revenue, nor a program for meeting needs and raising revenues.

With respect to the local level, a distinctive feature about North Carolina is that almost all local government responsibilities are placed in its 427 cities and 100 counties. North Carolina has fewer special districts, authorities and other political subdivisions than do most states. Townships, for example, exist only as administrative areas within the counties--chiefly for tax-listing and elections purposes. Substantially independent school districts were abolished in 1931.

The county is a significant political subdivision in North Carolina. Because the state has been largely rural through much of its history, people were able to identify most easily with their county. Counties ordinarily are assigned important administrative functions by the state, including the assessment and levying of taxes, the administration of public education, public health, law enforcement, and justice; planning and zoning of property (although not many counties do this); and the construction and maintenance of roads. The state's 100 counties vary in size from 180 to 944 square miles, and from 3,975 to 404,270 people in 1980.

Because of the unusual importance of counties in North Carolina, both city and county governments have broad powers and under the state's Interlocal Cooperation Act may exercise them separately or jointly. Two-thirds of local functions and services are authorized for both county and city governments and are often exercised by both.

Lawrence and Wicker (Institute of Government, 1982, pp. 12-14) point out ten additional characteristics of North

Carolina's division of responsibilities, powers, and functions between the state government and the various units of local government that, taken as a whole, distinguish it from most other states. They also influence the way in which public works are financed and provided, and will influence the feasibility and effectiveness of future options. The ten characteristics are:

1. Primary state responsibility for financing education and highways. Two functions for which state and local financial outlays are large--education and highways--are both financed primarily at the state level in North Carolina and from taxes imposed by the state. All states support these two functions from the state treasury to some extent, but few to the degree that North Carolina does. In most states the local financial responsibility is much greater. And since the major local tax is generally the property tax, the result is that in North Carolina the property tax is much less important in financing these two functions than in the nation at large.

2. Areawide, or "people," services at the local level are primarily a county responsibility. A number of the major services and functions--especially health, education, and welfare--are needed by the total population, by both people in rural areas and people in urban areas. In North Carolina the local responsibility for these functions is vested in the county, the one type of unit that covers the entire state. In contrast, in other states these functions may be vested locally in the counties, cities, special districts, or a combination thereof.

3. Primary responsibility of city governments for the high levels of some services that are needed in urban areas--fire

protection, law enforcement, refuse collection, water, sewerage, and streets. In this characteristic, North Carolina is much like other states, although some states use local authorities or special districts to provide such services as water, sewerage, and fire protection.

4. Authority for county governments to provide urban types of services. North Carolina counties have extensive authority to provide types of services needed by urban areas--water, sewerage, solid waste collection and disposal, recreation, and the like. This permits the county government, if it chooses, to provide these services in the urbanized fringe areas of cities, pending annexation, or throughout the county in unincorporated communities as may be necessary. And increasingly in North Carolina county governments are doing just that. In many other states these functions could be undertaken in such areas only by forming special districts or authorities.

5. Extensive authority to regulate and direct urban development. Both cities and counties in North Carolina are broadly authorized to undertake planning programs and to regulate land use through zoning and subdivision cntrol. Most cities have extraterritorial jurisdiction with respect to these controls. Local units in other states also have such powers, but not all states grant such wide authority.

6. Flexibility in city-county and multi-unit arrangements. Cities and counties in North Carolina also have broad authority to take joint or parallel action or to contract with one another for performance of functions that both are authorized to undertake. Such agreements may range from the joint financing of

a water line to the merging of tax collection offices.

7. A model system for major thoroughfare planning. North Carolina's system, in a procedure established in 1959 by which each municipality and the state's Department of Transportation jointly planned and adopt a major thoroughfare plan for each municipality and its surrounding area, is a nationally recognized approach that has served as a model for procedures adopted elsewhere.

8. A less regressive, more responsive state-local revenue system than most states have. The major taxes in North Carolina are the property tax, the general sales tax, the individual and corporate income taxes, and the gasoline tax. The property tax is levied by local governments only, the general sales tax by local and state governments, and the income taxes and the gasoline tax by the state only. Relatively speaking, rates for the sales and income taxes are average to high compaired with the rates imposed for the same types of taxes in other states, while the property tax in North Carolina is relatively less important in the total picture and the rates are low compared with those found elsewhere. Since the property tax is relatively less important, and since it is substantially regressive while income taxes are progressive, the resulting system is less regressive than most state-local structures in the nation. In terms of responsiveness to economic growth, the property tax everywhere tends to lag more than taxes directly tied to economic activity, such as income and sales taxes. Thus North Carolina's total revenue structure, because of the relatively small importance of the property tax, tends to be more responsive than most states'

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tax programs.

9. Reliance on general-purpose local governments. At the local level in North Carolina, almost all governmental responsibilities have been vested in county and municipal governments, to general-purpose units. Over 95 percent of expenditures of local governmental units in North Carolina are made through these two units. In most other states, special districts, school districts, and authorities are relatively much more important. The result is that North Carolina's urban areas do not have the multitude of overlapping units frequently found elsewhere.

10. Comprehensive and flexible municipal annexation procedures. In 1959 North Carolina adopted annexation procedures that are based on the general principal that whatever becomes urban in character should become municipal as well. This axiom accords both with the view that essentially all local government functions should be provided by either a county government or a city government and with the current allocation of responsibilities between these two units just described. To make this approach effective, procedures that permit cities to annex areas that need municipal services are necessary. With out such annexation powers, urban types of services must be provided in some other way--through the county, special districts, new incorporations, or the like--or not provided at all. The North Carolina procedures are regularly cited as a model throughout the nation and, despite occasional complaints by those being annexed, are usually considered to be successful.

To summarize, the North Carolina pattern of local government

reflects an arrangement that is flexible, provides for much local control, is state-oriented in financing, has produced essential taxing equity between tax payers inside and outside municipal boundaries, has tended to reduce rural-urban conflict, and has resulted in relatively simple governmental structure, with few units of government and limited overlapping jurisdictions. (Lawrence and Wicker, Municipal Government in North Carolina, The Institute of Government, 1982, pp. 12-14.)

The Capital Expenditures and Revenue Picture

Capital Expenditures

Table I-9 shows the proportion of the state's tax bills that is assumed by each level of government in North Carolina compared to the U.S. as a whole. A high proportion of the total tax bill is carried at the state level of government in North Carolina. The state's proportion of 71.7 percent is ninth highest in the nation.

At the state level, capital improvement expenditures have constituted an almost constantly decreasing proportion of the state's total authorized budget since 1973-74. See Table I-10. Capital improvement expenditures in the ten year period 1965 to 1974 averaged about 11 percent of the total state budget. In the last three years, it has averaged about six percent.

Of course, the trends in the state of North Carolina are not unusual. Capital improvements' share of state and local budgets has been declining since about 1970 generally across the nation, as is shown in Table I-11. While declining elsewhere, the

TABLE I-9

NORTH CAROLINA STATE AND LOCAL TAX BILLS

FOR 1978 (in millions)

Unit of Government	North Carolina Amount (in millions)	North Carolina Percent of Total		U.S. (1979)
State	2,657.4	71.7%		62.1%
Counties	654.1	17.6%		
Cities	352.5	9.5%	28.3%	37.9%
Districts	44.7	1.2%		

Source: North Carolina Department of Tax Research, Statistics of Taxation 1978, p. 5 as cited in Lawrence and Wicker, Editors. Municipal Government in North Carolina. The Institute of Government, Chapel Hill, NC, 1982. This tabulation overstates the cities' tax bill and understates the counties' and state's tax bills. The cities' share of taxes levied by the counties and the state (local sales tax, state gasoline tax, beer and wine, franchise, and intangibles taxes) are tabulated as part of the cities' tax bill although collected for them by counties and the state.

For U. S. Data: Advisory Commission on Intergovernmental Affairs. Tax Capacity of the Fifty States: Methodology and Estimates. Washington D.C.: The Author, March 1982. Table 2.

TABLE I-10

Funding for Capital Improvements in North Carolina by Source of Funds, 1965-8

	Biennial Budgets				Annual Budgets									RECOMMENDED [13]		
A. State Appropriated Funds for Capital Improvements:	1965-66	1967-68	1969-70	1971-72	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
1. Federal Revenue Sharing	–	–	–	–	$105,200,000	–	–	–	–	–	–	–	–	–	–	–
2. General Fund	$ 41,639,578	$ 112,856,788	$ 75,588,603	$ 64,891,192	$ 86,622,446	$ 47,200,000	$ 4,733,789	$ 16,126,218	$ 26,563,626	$ 32,230,000	–	–	–	–	–	–
3. Highway Fund (non-roads)	3,192,800	4,344,600	1,080,000	4,097,293	6,044,500	370,000	1,804,500	28,968,937	4,749,000	93,778,818	$ 84,378,719	$ 99,913,212	$ 30,005,727	$ 65,772,358	–	–
4. Wildlife Fund	341,254	901,127	160,000	805,986	243,486	–	–	–	1,625,600	1,533,995	2,707,282	2,767,142	1,200,000	5,073,000	$ 4,232,000	$ 544,000
5. Federal Funds	2,782,160	19,048,397	11,628,279	1,398,770	3,720,300	893,750	1,778,250	3,473,750	2,603,932	1,344,537	2,065,675	2,638,290	–	–	–	–
6. Self Liquidating	34,076,880	36,023,000	16,731,800	24,000,000	41,589,100	2,225,000	9,668,000	4,270,000	39,270,000	–	64,446,000	–	–	–	–	–
7. Other	–	–	–	–	733,875	640,300	32,625	205,625	296,375	780,000	247,600	767,024	–	–	–	–
8. Highway Fund – Road Construction[1]																
a. State construction and Maintenance	97,000,000	160,000,000	168,000,000	187,000,000	220,000,000	217,000,000	222,680,022	189,515,053	202,526,769	239,083,854	220,546,132	202,469,407	253,823,264	303,990,116	312,586,000	311,938,000
b. State Matching Funds Matched with Federal Aid	34,806,864	33,797,332	35,307,645	67,460,595	38,785,605	46,993,248	35,750,387	62,740,266	53,370,601	42,729,448	52,622,297	12,777,486	12,714,934	23,537,420	14,734,000	12,268,000
TOTAL APPROPRIATIONS FOR CAPITAL IMPROVEMENTS	214,036,656	303,471,444	308,475,827	347,653,836	500,939,312	351,397,335	300,376,121	347,300,989	331,884,073	411,882,652	427,013,705	321,332,871	327,749,925	398,372,894	331,572,000	324,770,000
Total Authorized State Budget[2]	2,217,400,000	2,746,600,000	3,589,000,000	4,455,600,000	2,877,900,000	3,080,900,000	3,247,600,000	3,462,600,000	3,977,300,000	4,410,900,000	5,037,309,000	5,443,100,000	5,874,000,000	5,984,000,000	6,180,196,375	6,373,599,038
TOTAL APPROPRIATIONS FOR CAPITAL IMPROVEMENTS AS PERCENTAGE OF TOTAL AUTHORIZED STATE BUDGET	9.7%	11.0%	8.6%	7.8%	17.4%	11.4%	9.2%	8.9%	8.3%	9.3%	8.5%	5.9%	5.6%	6.7%	5.4%	5.1%
B. Other Capital Improvements Funded by Federal Aid & Bond Issues																
1. Road Construction Funds[3]																
a. Federal Aid	–	60,823,831	74,772,211	110,661,742	96,906,376	208,630,694	104,143,959	189,677,549	226,500,698	197,821,948[4]	208,858,766	166,141,122	163,180,600	231,446,635	N.A.[16]	N.A.[16]
b. Road Bonds	–	–	–	–	–	–	–	–	60,000,000	60,000,000[4]	–	180,000,000	75,000,000	–	–	–
2. Statewide Bond Issues[3]	60,000,000[4]	40,000,000[4]	–	45,995,000[5]	–	1,302,760[5]	–	–	–	–	–	–	–	–	–	–
	17,970,000[5]	–	–	–	–	29,500,000[5]	15,000,000[5]	35,000,000[5]	30,000,000[5]	4,000,000[5]	28,000,000[6]	–	–	8,000,000[5]	–	–
	–	–	–	–	45,000,000[7]	105,000,000[7]	90,000,000[7]	25,000,000[7]	16,250,000[7]	10,750,000[7]	–	–	–	–	–	–
	–	–	–	–	–	–	–	23,000,000[10]	18,250,000[10]	–	–	–	–	82,000,000[11]	–	–
	–	–	–	–	–	–	–	–	–	30,000,000[11]	–	–	70,000,000[11]	–	–	–
TOTAL BONDS SOLD	77,970,000	40,000,000	-0-	45,995,000	45,000,000	136,000,000	105,000,000	83,000,000	124,500,000	134,750,000	28,000,000	105,000,000	145,000,000	90,000,000	–	–
TOTAL BONDS SOLD AS PERCENTAGE OF TOTAL AUTHORIZED STATE BUDGET	3.5%	1.5%	0%	1.0%	1.6%	4.4%	3.2%	2.5%	3.1%	3.1%	0.6%	1.9%	2.5%	1.5%	–	–

FOOTNOTES:

[1] Source: Fiscal Section, Dept. of Transportation.
[2] Summary of the Recommended State Budget 1981-83, p. 75.
[3] Source: Annual Report for 83 Ending 6/30/81 Dept. of State Auditor. Amounts are as of end of fiscal year. In figures appear for 1981-82 because fiscal year has not ended. Amounts are for bonds issued, not authorized.
[4] Issued under $100 million Public School Facilities Bond of 1963.
[5] Issued under $17.98 million Capital Improvements for State Institutions Bond of 1967.
[6] Issued under $65.98 million Capital Improvements Legislative Bond of 1971.
[7] Issued under $300 million Public School Facilities Bond of 1973.
[8] Issued under $2 million Zoo Bond of 1971.
[9] Issue under $150 million Clean Water Bond of 1971.
[10] Issue under $47.25 million Capital Improvements for Higher Education Bond of 1975.
[11] Issue under $230 million Clean Water Bond of 1977. (More bonds could be issued in the future.)
[12] No bonds have been approved by the voters at the writing under the $300 million Clean Water Bond authorized by the General Assembly in 1981. Bond issues in notes 4-11 were first authorized by the legislature and then approved by the voters.
[13] Source: Summary of the Recommended State Budget: 1983-1985 Biennium, Tables B, 1A, 9
[16] N.A. = not available

This table was prepared and compiled by Vance Sanders, an author of this article and Center Director Ran Coble. Intern Ann and Carla Harrell. Letter issues, assisted with research and computations.

TABLE I-11

CAPITAL IMPROVEMENT EXPENDITURES AS A PERCENTAGE OF TOTAL GOVERNMENTAL BUDGETS

Fiscal Year Ending	North Carolina	States & Localities, Generally[1]
1960		27.1%
1965	9.7%	26.8
1966	9.7	
1967	9.7	
1968	11.0	28.7
1969	11.0	
1970	8.6	21.8
1971	8.6	
1972	7.8	N.A.
1973	7.8	
1974	17.4	
1975	11.4	18.0
1976	9.2	15.9
1977	8.9	14.4
1978	8.3	15.7
1979	9.3	15.7
1980	8.5	15.4
1981	5.9	N.A.
1982	5.6	N.A.
1983	6.7	N.A.

[1]Source: George E. Peterson, "Rebuilding Public Infrastructure: The Institutional Choices," in George Lefcoe, editor, Urban Land Policy for the 1980s: The Message for State and Local Government, Lexington, Massachusetts: Lexington Books, 1983.

N.A.- not available

proportion of state and local budgets given to capital improvements is at least 60 percent higher outside of North Carolina.

Sources of Capital Funds

The major sources of capital funds at the state level in North Carolina have been revenue sharing, the highway fund, and bond issues.

Revenue sharing pumped $500 million into North Carolina's state government. Nearly half of that--$232 million--went straight into capital spending. Termination of revenue sharing to state governments has eliminated this source of funds.

A highway fund account is separate from the general operating fund and has financed much of the state's highways and bridges. Since 1973, the amount spent on roads from this fund has hovered around $260 million per year, even as the state budget has more than doubled. The amount jumped to $297 million for fiscal year 1982 and $317 million in fiscal year 1983, subsequent to the legislature approving a three-cent per gallon tax increase and a package of license and fee increases to replenish the fund. Even so, revenues have barely kept up with necessary road maintenance, and the three-cent boost, which represents a 33 percent increase in the highway fund base, will not be enough for long. It will not, for example generate enough revenue to enable the state to match the increase in federally available highway funds generated by the new five-cent federal tax on gasoline. Few roads have been built in the last two years and few are planned for the next several years. The legislature

may be faced with proposals for more tax increases for the highway fund in the near future. More detailed discussion of the highway fund occurs in Chapter II.

Bond issues, nearly $1 billion worth over the last 20 years, have helped finance almost two of every five dollars spent on capital improvements in the state. Table I-10 shows the chronological and funtional distribution of these bonds in the bottom half of the table. While some state officials have expressed doubt that North Carolina can continue to rely so extensively on bond issues for capital funds, the state bonds issued over the past five years has averaged 1.8 percent of the total state authorized budget, down from an average of over 3 percent in the years 1974 to 1978. An average of a little less than one hundred million dollars of bonds per year have been sold within the past five years, FY 1979 to FY 1983, compared to the average of more than 112 million the previous four years, FY 1975 to FY 1978.

Although the legislature passed a $300 million clean water bond in October of 1981, the governor has not yet proposed the necessary referendum for voters to approve issuance of the bonds. Similarly, the state has held off bringing a proposed school bond issue before the legislature during the past two years due to a strong expectation that the voters would not support it. Virtually all highway, school, and clean water bond issues have expired or been committed over the past three years, leaving the state with a major gap in revenue sources for capital projects.

North Carolina's Fiscal Capacity

North Carolina is not a wealthy state, as has been shown by the economic discussion earlier in this chapter. Indicators of its capacity to raise revenues, as estimated by the Advisory Commission on Intergovernmental Relations (Tax Capacity of the Fifty States: Methodology and Estimates, 1982), are shown in Table I-12. North Carolina ranked 45th in the "representative tax system" index and tied for 42nd with three other states in the personal income index.

On the other hand, North Carolina's overall state and local level tax effort (as distinquished from capacity) in 1979 was rated by ACIR as 92. That is, the state's "effort" is only 92 percent of the average for all states. Further its tax effort index in 1979 was slightly lower than its index in 1967. Thus, North Carolina's effort is less than average and has declined slightly over the 1970s. Table I-13 shows tax effort and tax capacity indices for North Carolina for 1979 for several tax sources. As the table shows, the state's capacity is lower than the U.S. average for almost all sources, and especially for the three major sources--general sales taxes, individual income tax, and property tax. Its effort is high for the individual income tax and very low for the general sales tax and property tax, compared to its capacity and to the U.S. average.

Projections of Revenue

Projections of revenue for the state are not available beyond the very short range. Even projections of personal income, the primary revenue base indicator, are very uncertain,

TABLE I-12

FISCAL CAPACITY INDICES: 1979

	Representive Tax System Approach[a]	Per Capita Income [b]
U.S.	100	100
Southeast U.S (12 states)	89	87
North Carolina	82	84
Lowest State: Mississippi	71	70
Highest State: Alaska	215	128

(a) An Advisory Commission on Intergovernmental Relations index based on estimates of revenue a state would raise if it applied the U.S. average tax rate to a range of taxable resources; thus it is a measure of total tax base.

(b) Resident personal income as estimated by U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, Washington D.C., August 1980.

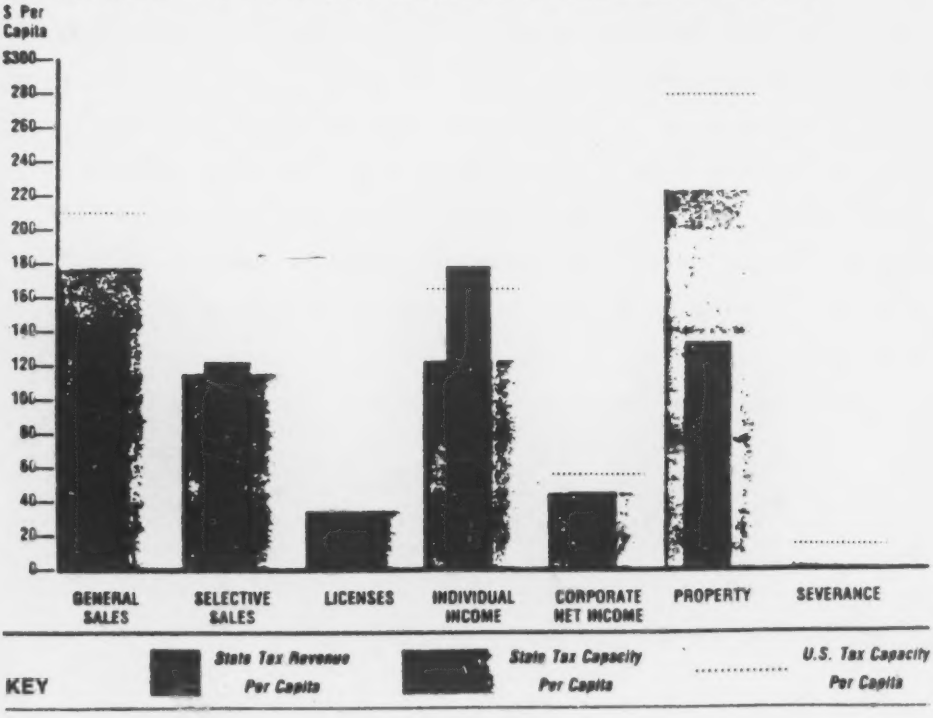
Source: ACIR. Tax Capacity of the Fifty States: Methodology and Estimates. Washington, D.C.: The Author, March 1982. Table 3.

TABLE I-13
TAX EFFORT AND TAX CAPACITY INDICES FOR NORTH CARCLINA

	1967	1975	1977	1979	FISCAL BLOOD PRESSURE: (1967–1979) 92/98
Tax Effort	94	87	88	92	
Tax Capacity	78	84	83	82	

1979 Tax Source	Tax Capacity Per Capita	Tax Capacity Index	Aggregate Tax Capacity	Total Collections	Tax Effort Index	Collections Less Capacity	Collections Per Capita
General Sales	$178.99	84.9	$1 003.411	$826.500	82.4	–$176.911	$147.43
Selective Sales	$114.58	98.3	$642.338	$683.288	106.4	$40.949	$121.89
License Taxes	$34.05	101.7	$190.888	$186.255	97.6	–$4.632	$33.22
Personal Income	$121.33	73.6	$680.185	$996.227	146.5	$316.041	$177.71
Corporate Income	$44.47	78.0	$249.282	$254.778	102.2	$5.495	$45.45
Total Property	$221.88	79.9	$1.243.884	$750.000	60.3	–$493.884	$133.79
Estates & Gift	$6.10	67.7	$34.179	$39.352	115.1	$5.172	$7.02
Severance	$0.43	2.9	$2.404	$0	0.0	–$2.404	$0.00
Total Taxes	$721.83	81.6	$4.046.575	$3.736.400	92.3	–$310.174	$666.50

NOTE: All per capita amounts are in dollars; aggregate fiscal capacity and total collections are in thousands of dollars.



Source: ACIR, March, 1982

although estimates based on projections made by the Office of State Management and Budget for the NC 2000 project are shown in Table I-8 and discussed above.

Based on those projections of personal income for the state to the year 2000, and based on a very stable ratio of personal income to general fund revenues that has existed over the past ten years, crude estimates of total state authorized expenditures have been calculated. They are shown in Table I-14. Two capital expenditure projections are provided. In one projection scenario, it is assumed that capital expenditures will average 5.7 percent of the total state authorized expenditures, as they have for the budgets in the five year period from 1980-81 to 1984-85. This more pessimistic of the two projections will yield 8.46 billion dollars in the eighteen year period, 1983-2000. The second and more optimistic scenario assumes money available for capital expenditures will average 9 percent of total authorized expenditures, which is the average during the ten year period 1973-74 to 1982-83. This assumption yields a cumulative projection of 12.32 billion dollars over the same eighteen year period.

TABLE I-14

PROJECTED
PERSONAL INCOME
AND STATE CAPITAL EXPENDITURES
IN NORTH CAROLINA

($ BILLIONS)

YEAR	PROJTED PERSONAL INCOME	PROJTED REAL PERSONAL INCOME ($ 1982)	PROJTED ST GVMT EXPEND	PROJECTED EXPENDITURES FOR CAPITAL OUTLAY ASSUMING 5.7%	PROJECTED EXPENDITURES FOR CAPITAL OUTLAY ASSUMING 9.0%
1983	58.23	55.27	6.00	.3983 *	
1984	63.76	57.51	6.20	.3316 *	
1985	70.00	59.88	6.40	.3248 *	
1986	77.00	62.41	6.76	0.39	0.61
1987	84.67	64.85	7.04	0.40	0.63
1988	93.92	67.26	7.32	0.42	0.66
1989	102.61	69.65	7.59	0.43	0.68
1990	112.11	71.61	7.82	0.45	0.70
1991	122.93	73.86	8.08	0.46	0.73
1992	134.47	76.15	8.34	0.48	0.75
1993	146.60	78.29	8.59	0.49	0.77
1994	159.67	80.44	8.83	0.50	0.79
1995	173.92	82.72	9.10	0.52	0.82
1996	190.32	85.51	9.42	0.54	0.85
1997	208.07	88.37	9.75	0.56	0.88
1998	227.20	91.22	10.07	0.57	0.91
1999	247.99	94.15	10.41	0.59	0.94
2000	270.69	97.18	10.76	0.61	0.97
TOTAL	2539.91	1355.04	148.36	8.46	12.74

* CURRENTLY BUDGETED

SOURCE : ADAPTED FROM DATA PROVIDED BY OFFICE OF STATE MANAGEMENT AND BUDGET

Summary

The 1980 population of North Carolina was 5.9 million persons. By the year 2000, the state is expected to grow by 17 to 25 percent to a population of between 6.8 and 7.3 million people. Thus, the state's infrastructure will have to support between 900 thousand and 1.4 million more people, or between 325,000 and 500,000 additional households, if the household size remains unchanged. Anticipated increases in urbanization, the proportion of elderly, (but not children), and possibly smaller household size will translate the population increases into infrastructure needs (except schools) even greater than the 17 to 25 percent population growth.

Nonfarm employment is expected to increase by 47 percent by 2000, over the 1980 employment, approximately twice the rate of population growth. Adequate public infrastructure and a sound program for maintaining and expanding it will be a factor in influencing the level and location of the major private sector economic development and investment decisions, and vice versa.

While the population of North Carolina still resides predominantly in rural residences and small towns, making it the fifth most rural state in the nation, that pattern is changing. Employment and commercial growth, especially, seem to be shifting to metropolitan areas where the need for public infrastructure will be greater than it was with a rural and small town pattern in which water and sewer are often provided privately.

North Carolina's state government does no overall, systematic capital improvement planning or programming. What

planning is accomplished is done by individual agencies. There is no systematic long range projection of overall capital investment needs or anticipated revenues. Nor is there a long range program of capital investment or for raising the necessary revenues.

The state government's authorized capital expenditures average 368 million dollars per year over the past decade, approximately 9 percent of the total state budget. While the amounts have been increasing since 1973, the increases have not kept up with inflation and are a constantly decreasing proportion of the state's budget--from 17.4 percent in 1973-74 to 6.7 percent in 1982-83. Capital expenditures are projected to be below 6 percent of the total state budget for the next two fiscal years.

Of the major bond authorization acts, none have significant monies remaining and the state has not provided new bond money sources since the 1977 Act. Action on two major bond proposals have been postponed since that time, although the state's gasoline tax was increased to provide more highway funds.

North Carolina's capacity to raise revenues is relative low, compared to other states. It ranks 42nd to 45th among the states, having approximately 70 percent of the average state's capacity to raise revenues. On the other hand, North Carolina's state and local government tax effort, relative to its revenue base, is also below the U.S. average.

Personal income, a major determinant of the revenue raising capacity of the state is expected to increase from 54 billion dollars in 1982 to 97 billion (in 1982 dollars), an 80 percent

increase. Thus, total personal income is projected to grow approximately twice as fast as employment and over three times as fast as population. Assuming that past relationships between personal income, total state government expenditures, and capital expenditures continues and that projections of the state's total personal income are reasonable, between $8.46 billion and $12.74 billion should be available for capital expenditures by state government for the 18 year period from 1983 to the year 2000.

CHAPTER II

TRANSPORTATION

Highway Program

Background on Historical Trends

Basic information. The state of North Carolina has the largest state-maintained highway system in the United States. Of the 92,303 miles of road in North Carolina, 75,971 miles are maintained by the state. Rural roads consist of 70,254 miles, with 5,694 miles classified as urban. In addition, the North Carolina road system has nearly 15,000 bridges, all maintained by the state.

The following analysis is based largely upon the REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION ON TRANSPORTATION NEEDS AND FINANCING, issued in 1981. The data provided by this report have been supplemented by interviews with Department of Transportation officials, and the Department's THIRTY FOURTH BIENNIAL REPORT, issued in January, 1983. The assessment of needs includes all existing urban and rural bridges (15,300) plus new ones to be constructed.

Revenue trends. Funding for the construction and maintenance of the state highway network comes from five major sources :

1) Federal aid
2) State gasoline tax
3) Licenses and fees
4) State treasurer's investments
5) Highway bonds (designated for construction)

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Monies from the first four categories go into the Highway Fund, while there are separate funds for the 1965 and 1977 State Highway Bonds.

Table II-1 shows the major sources of highway revenue over the last thirteen years. In addition, in both 1965 and 1977 $300 million in Highway Bonds were authorized. Since the bonds are repaid from the Highway Fund they do not really constitute an additional revenue source. One cent of the twelve cents per gallon gas tax is designated for bond repayment. In 1981 the state General Assembly approved a package of tax and license increases designed to boost revenues for the Highway Fund. This legislation included a three cent per gallon increase in the gasoline tax.

Expenditure trends. The three broad categories of highway expenditure are operations and administration, construction, and maintenance. Unfortunately, the United States Department of Transportation and the North Carolina Department of Transportation do not share uniform definitions of even these broad categories. For example, contract road resurfacing is counted as capital outlay (construction) in the federal HIGHWAY STATISTICS, while the same operation is considered as maintenance in the state budget and reports. Table II-2 displays the amounts the state has spent on construction and maintenance for the last ten years, according to the state categories. Table II-3 shows the state expenditures for the same period, according to the federal definitions.

One of the single most important categories of maintenance

TABLE II-1

HIGHWAY FUND REVENUE

($ MILLIONS)

YEAR	GAS TAX	LICENSES AND FEES	TREAS INVEST	FEDERAL FUNDS	TOTAL
1973	272.00	89.40	11.10	14.80	387.30
1974	276.20	89.70	18.50	106.20	490.60
1975	273.00	88.00	23.90	277.90	662.80
1976	286.40	103.90	15.10	51.70	457.10
1977	298.30	106.40	11.90	254.40	671.00
1978	312.00	114.30	9.90	160.40	596.60
1979	322.80	120.60	21.70	218.80	683.90
1980	305.90	121.00	10.70	225.00	662.60
1981	291.30	126.90	13.90	203.10	635.20
1982	380.80	146.30	2.30	163.10	692.50
1983	378.10	150.40	16.80	150.10	695.40

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION AND RECOMMENDED STATE BUDGET, 1983-1985

TABLE II-2

HIGHWAY EXPENDITURES BY STATE CATEGORIES

($ MILLIONS)

YEAR	CONST	MAINT	TOTAL	% CONST	% MAINT
1972	238.60	94.60	333.20	71.61	28.39
1973	242.70	98.30	341.00	71.17	28.83
1974	208.20	86.20	294.40	70.72	29.28
1975	232.20	129.70	361.90	64.16	35.84
1976	324.40	109.70	434.10	74.73	25.27
1977	315.50	131.10	446.60	70.64	29.36
1978	300.50	144.40	444.90	67.54	32.46
1979	356.50	155.70	512.20	69.60	30.40
1980	431.10	180.20	611.30	70.52	29.48
1981	386.70	163.90	550.60	70.23	29.77
1982	300.40	216.90	517.30	58.07	41.93
TOTAL	3336.80	1510.70	4847.50		
AVERG	303.35	137.34	440.68		

SOURCE : NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TABLE II-3

HIGHWAY EXPENDITURES BY FEDERAL CATEGORIES

($ MILLIONS)

YEAR	CONST	MAINT	TOTAL	% CONST	% MAINT
1972	232.49	92.18	324.67	71.61	28.39
1973	228.95	92.47	321.42	71.23	28.77
1974	207.99	121.44	329.43	63.14	36.86
1975	272.34	129.23	401.57	67.82	32.18
1976	330.92	121.61	452.53	73.13	26.87
1977	294.50	148.61	443.11	66.46	33.54
1978	322.72	152.55	475.27	67.90	32.10
1979	375.85	178.06	553.91	67.85	32.15
1980	411.67	186.18	597.85	68.86	31.14
1981	314.96	188.09	503.05	62.61	37.39
TOTAL	2992.39	1410.42	4402.81		
AVERG	299.24	141.04	440.28		

SOURCE : HIGHWAY STATISTICS

is road resurfacing. In order to keep the present system functioning the state must resurface about 2600 miles annually. The actual miles resurfaced appear in Table II-4.

In connection with expenditure trends, the problem that has confronted the Department in recent years is this : income from the gas tax, the major source of revenue for the Highway Fund, has remained relatively constant, while inflation has dramatically driven up the cost of building and maintaining the highway system. From 1967 to 1980 costs for construction increased by 378%, and costs for maintenance increased by 240%. The significance of these cost increases will be discussed below.

Existing Condition of the Highway System

A 1979 sample of 5% of the state system found that heavy resurfacing was required for

1) 17% of the primary system,
2) 13% of the paved secondary system, and
3) 20% of the urban system.

Light surface treatment was needed for another

1) 47% of the primary system,
2) 33% of the secondary system, and
3) 30% of the urban system.

Major repatching was needed for 44 percent of the entire network. A subsequent survey of all 76,000 miles of the state system found that the earlier sample somewhat over-estimated the repair needs by about 17%, yet even with the revision, the maintenance needs are still substantial.

The most pressing question is that of deferred maintenance. The Commission report cites evidence that cost of resurfacing a road while it is still in fair condition is about one-third the

TABLE II-4

HIGHWAY RESURFACING

YEAR	MILES RESURFACED
1970	2300
1971	2700
1972	2100
1973	2550
1974	1500
1975	1000
1976	1800
1977	1400
1978	1300
1979	1800
1980	900
1981	900
1982	4400
1983	3700
1984	3300 *
1985	3300 *

* PROJECTED FIGURES

SOURCE : REPORT OF THE GOVERNOR'S
BLUE RIBBON COMMISSION,
DEPARTMENT OF TRANSPORTATION

cost of resurfacing a road in very poor condition. Recognizing this problem, the state legislature began, in 1981, designating money specifically for contract resurfacing, approximately $80 million per year. The annual miles of road resurfacing has risen, as shown in Table II-4, and the backlog is steadily being eliminated, but North Carolina must continue adequate highway maintenance or sometime in the future the state will face the difficult choice of paying very high resurfacing costs, or abandoning part of the highway network.

Estimates of Capital Investment Needed

Construction. Within the foreseeable future, there will be very little state funded construction of brand new roads. (Some right of way aquisition for upgrading may give the appearance of new construction.) Rather, the great majority of construction will involve upgrading of existing roads. The Commission developed a series of five possible highway construction programs, based upon the level of service desired by the state. (See Table II-5.) Condition I is the most expensive and involves bringing nearly all the state's roads up to high standards for road width, bridge load limits, etc. Condition V is the least expensive, and would include virtually no upgrading of service levels. Conditions II to IV represent varying levels of service between the minimum and maximum options. Bridge replacement and construction are included in the total Condition costs.

The Commission felt that Condition III (also called the Basic Alternative) "represents the minimum level of service which

ultimately should be considered in a long-term highway program." In addition to the Basic Alternative, a Desirable Alternative was described that is composed of the most important elements of Conditions I and II.

Finally, the Commission acknowledged the current financial crisis facing the people of North Carolina, which makes it difficult to fund even the Basic Alternative. One other alternative was therefore presented, a Minimum Highway Program that would emphasize maintenance over construction, until the backlog of deferred maintenance was eliminated over a five-year period. This Minimum Program is a short-term option.

Maintenance. The Blue Ribbon Commission recommended a three part maintenance program consisting of

1) Continuation of the current program,
2) Elimination of the backlog over a five year period, and
3) Expansion of current maintenance to insure the continuing adequacy of the road network.

From 1980 to 2000 adequate maintenance will require $221.6 million per year, for an eighteen-year total of $4 billion. This is the maintenance component to accompany the Minimum (or any other) highway construction program. Table II-5 summarizes the costs of the various programs explored by the Commission.

Future Revenue Projections

The highway portion of North Carolina's infrastructure is both fortunate and unfortunate to be funded in a manner different from all other state expenditures. Since state road construction and maintenance are paid for from the Highway Fund and not the

TABLE II-5

COSTS OF BLUE RIBBON COMMISSION
ALTERNATIVE HIGHWAY PROGRAMS

($ MILLIONS)

	COND I	COND II	COND III	COND IV	COND V	BASIC	DESIRB	MINIM
AVR CONST COST	1105	780	382	304	193	382	656	220
AVR MAINT COST	222	222	222	222	222	222	222	261
OTHER DOT NEEDS	170	170	170	170	170	170	170	170
YEARLY TOTAL	1497	1172	774	696	585	774	1048	651
18 YEAR TOTAL	26946	21096	13932	12528	10530	13932	18864	---

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

General Fund, they do not have to compete directly with other state programs in the budget process. Until recent years the user fees collected through the gas tax and licensing fees were quite sufficent to fund the highway program.

However prospects for the future of the Highway Fund are not clear. Revenues from the gasoline tax (the majority of the Highway Fund income) will depend on the amount of gasoline consumed in future years, and two factors make those figures difficult to predict.

First, as the cost of gasoline rises and falls, demand decreases and increases. With the short-term outlook for gas prices very uncertain, even the most informed guesses about long-term prices must be suspect.

Second, if the average new car fuel efficiency continues to climb, Highway Fund gas tax revenues will decline, even with an increase in miles traveled. A recent Office of Technology Assessment report states that by the year 2000 automobile fuel efficiency could climb as high as 80 miles per gallon. This would result in an additional maintenance burden from the added miles of travel, when at the same time gas tax revenues were dropping.

The Blue Ribbon Commission report contained revenue projections for the twenty years from 1980 to 2000. These figures are the best long-term projections available, but they are based upon an economic model that predicted high continued inflation and increasing gasoline prices. Table II-6 summarizes the Commission's projections, based on the current (1983) tax rates.

TABLE II-6

COMMISSION PROJECTED HIGHWAY FUND REVENUE

($ MILLIONS)

	81-85	LESS 81	LESS 82	83-85	86-90	91-2000	TOTAL	% TOTAL
.09 GAS TAX	1065.40	272.20	267.30	525.90	1257.40	2457.00	4240.30	30.71
.03 GAS TAX	355.20	102.50	115.80	136.90	418.80	819.00	1374.70	9.96
TRUCK PLATES	266.50	62.90	65.40	138.20	372.40	878.10	1388.70	10.06
15% T.P. INCR	39.98	9.44	9.81	20.73	55.86	131.72	208.31	1.51
AUTO PLATES	178.50	43.00	44.10	91.40	247.40	565.20	904.00	6.55
DRIVERS LICENSES	46.50	10.70	11.00	24.80	65.00	151.00	240.80	1.74
$6.00 D.L. INCR	55.80	13.20	13.80	28.80	78.00	181.20	288.00	2.09
TITLE FEES	36.00	8.50	8.60	18.70	52.00	119.70	190.40	1.38
$1.50 T.F. INCR	21.30	5.10	5.25	10.95	30.80	70.80	112.55	0.82
FEDERAL FUNDS	1210.00	200.00	200.00	810.00	1350.00	2700.00	4860.00	35.20
18 YEAR TOTAL	3275.18	727.54	741.26	1806.38	3927.66	8073.72	13807.76	100.00

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

One additional unknown casts a shadow over the future funding of the Highway Program. In 1982-1983 the state was able to receive its full share of federal highway matching funds only by utilizing the last of the 1977 Highway Bond money. For the 1983-1984 fiscal year, there will be a $27.5 million deficiency in state matching funds, increasing to $29.9 million in 1984-1985. This will mean the loss of $106.9 million in federal aid for 1983-1984, and a loss of $116.5 million in 1984-1985. At present there is no consensus about how the state should secure the additional funding.

Future Revenue Shortfalls

The unknown effects of the factors just mentioned make it difficult to predict the size of the potential funding shortfall for the highway program. If the projected Highway Fund revenues in the Commission Report are generally accurate, and if inflation does not become a major factor, and if the state is able to raise enough money to secure all the federal matching funds available, then North Carolina still faces an 18 year shortfall of $125 million in funding the Basic Program, or a 5 billion dollar shortfall in funding the Desirable Program. These figures assume no inflation. With only 3% inflation, the Basic shortfall would increase to over four billion dollars, and the Desirable shortfall would top ten billion dollars. With 6% inflation the Basic shortfall rises to ten billion dollars, and the Desirable shortfall balloons to twenty billion dollars. These numbers should be understood as the minimum possible shortfalls, the maximum would be even more difficult to predict.

Policy Options

The Governor's Commission considered a wide variety of policy options to deal with the expected shortfall of revenue for the highway fund. These options can be grouped into five broad categories.

First, the current method of computing the gas tax could be changed from an absolute tax of cents per gallon to a proportional tax based upon the current wholesale or retail gas price. The advantage of such a tax would be its responsiveness to inflationary rises in the price of gas. However, a decline in prices would lead to a decline in revenues as well. Several states use proportional gas tax methods, including Kentucky, Indiana, Nebraska, New Mexico, and Washington.

Second, the existing structures of the gasoline tax and license fees can be retained, with current fees and taxes being raised. This was the option chosen by the state in 1981, when the gas tax was raised by three cents per gallon, and other fees were increased as well.

Third, current non-Department of Transportation functions such as the Highway Patrol, could be funded out of the General Fund instead of the Highway Fund, freeing additional money for the highway program.

Fourth, additional sources of funding could be designated for the highway program, such as a portion of an increased state sales tax currently being considered by the State Legislature. Another possibility is to raise the sales tax on vehicles (until now, 2 percent) and lift the ceiling (now $120), designating the

additional revenues for the Highway Fund.

Finally, road funding from the General Fund could supplement the revenues of the Highway Fund.

Other State-Funded Transportation

The state of North Carolina also provides some funding for public transportation, aviation, and railroad infrastructure needs. These monies are provided by the General Fund, and must compete for funding in the State Legislature with all other non-highway programs. Table II-7 shows the money appropriated (or recommended for appropriation) for non-highway transportation from 1974 to 1984.

The Governor's Blue Ribbon Commission investigated each of these areas to determine the extent of the need for state funding and to suggest the most appropriate level of funding. The following discussion summarizes the Commission's findings for each category.

Public Transportation

Public transportation needs can be divided into urban transit and rural transit needs. Tables II-8 and II-9 show the capital and operating needs projected for 1983 to 2000, the 10 percent traditional state share applied to the capital needs for urban and rural transit, and the state's share of operating expenses.

Within North Carolina seventeen cities have urban public transit systems, eleven publically owned and six privately owned. These systems will need to purchase 1022 replacement vehicles and 1058 additional vehicles by 2000. This is by far the greatest share of urban capital needs.

Concerning rural transportation the North Carolina

TABLE II-7

OTHER TRANSPORTATION
GENERAL FUND APPROPRIATIONS

($ MILLIONS)

YEAR	PUBLIC TSPTN	AVIATN	RAILRDS	TOTAL
1975	------	3.00	------	3.00
1976	------	1.13	------	1.13
1977	0.91	1.99	------	2.90
1978	1.06	1.62	------	2.68
1979	1.01	1.62	------	2.63
1980	1.34	3.62	0.10	5.06
1981	1.34	1.62	0.10	3.06
1982	1.34	3.50	0.10	4.94
1983	1.34	3.50	0.10	4.94
1984	1.34	3.50	0.10	4.94
1985	1.34	3.50	0.10	4.94

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION, AND SUMMARY OF THE RECOMMENDED STATE BUDGET, 1983-1985

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TABLE II-8

URBAN TRANSIT FUTURE NEEDS

($ MILLIONS)

YEAR	83	84	85	83-85	86-90	91-2000	18 YEAR TOTAL
CAPITAL AND PLANNING	48.87	29.55	24.47	102.89	72.42	184.85	360.16
OPERATING EXPENSES	22.05	25.34	29.11	76.50	183.67	457.44	717.61
TOTAL	70.92	54.90	53.58	179.39	256.09	642.29	1077.78

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

URBAN TRANSIT
RECOMMENDED STATE FUNDING

($ MILLIONS)

YEAR	83	84	85	83-85	86-90	91-2000	18 YEAR TOTAL
CAPITAL AND PLANNING	4.89	2.96	2.45	10.29	7.24	18.49	36.02
OPERATING EXPENSES	1.86	2.13	2.46	6.45	15.13	37.61	59.19
TOTAL	6.74	5.09	4.91	16.74	22.38	56.10	95.21

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

TABLE II-9

RURAL TRANSIT FUTURE NEEDS

($ MILLIONS)

YEAR	83	84	85	83-85	86-90	91-2000	18 YEAR TOTAL
CAPITAL AND PLANNING	1.35	1.35	1.95	4.64	9.73	22.61	36.98
OPERATING EXPENSES	1.25	1.44	1.50	4.19	14.30	36.42	54.91
TOTAL	2.60	2.79	3.44	8.83	24.03	59.03	91.89

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

RURAL TRANSIT
RECOMMENDED STATE FUNDING

($ MILLIONS)

YEAR	83	84	85	83-85	86-90	91-2000	18 YEAR TOTAL
CAPITAL AND PLANNING	0.13	0.13	0.19	0.46	0.97	2.24	3.68
OPERATING EXPENSES	0.31	0.36	0.37	1.05	3.58	9.11	13.73
TOTAL	0.45	0.49	0.57	1.51	4.55	11.35	17.41

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

Department of Transportation has prepared a report on "Transportation Options for Rural and Small Urban Communities." This report found that sufficient need for rural transportaion programs exists (or soon will exist) in 36 counties. The major portion of rural capital needs is small nine to fifteen passenger vans for the "transportation disadvantaged," the elderly, low income, and handicapped.

If the present trend in state spending for public transportation is continued ($1.34 million per year), $24.12 million will be available for the 18-year period and there will be an $88.5 million shortfall in the recommended state share of projected public transportation capital and operating funding over the next 18 years. If the anticipated $24 million were divided in the same proportions as the recommended state funding requirements shown in Tables II-8 and II-9, there will be $8.49 million for capital improvements. This represents a shortfall of $31.2 million for capital improvements.

Aviation.

The Governor's Commission analysis of aviation relied upon the North Carolina Airport System Plan, issued in the mid-1970s. The capital improvement needs identified in the System Plan were updated through 1979 and converted into 1980 dollars for a total needs estimate of 765 million dollars from 1980 to 2000, and 603 million dollars for the eighteen year period, 1983-2000. The Commission went on to explore twelve alternatives for funding the program, recommending an option which calls for state funding of 50% of the non-federal share on federally funded projects, and a

10% to 50% share of non-federally assisted projects.

The adoption of this plan would result in a total state expenditure of $139.7 million from 1983 to 2000. At the present level of funding (3.5 million dollars per year), $63 million will be provided, leaving a $76.7 million shortfall over the next 18 years. Table II-10 displays the total estimated needs and the recommended state share.

Railroads

North Carolina is fortunate to have its rail system dominated by two financially healthy railroads, the Southern, and the Seaboard Coast Line. The state has traditionally played a small role in the financing of rail infrastructure. In recent years $100,000 per year has been appropriated to aid in the rehabilitation of certain rail lines, and about $60,000 per year (from the Highway Fund) has gone to railroad planning and administration.

The Commission identified rail line abandonment (due to high rehabilitation costs and low line revenues) as the major problem facing the state rail system. Four degrees of need for state funding were identified corresponding to the desired level of prevention of line abandonment. Condition I would maintain all current rail service with both operating subsidies and rehabilitation support, at a cost to the state of 51.7 million dollars over a 18 year period. Condition II would utilize subsidy and rehabilitation funds everywhere rail users would be affected by abandonment, at a cost of $34.8 million. Condition III provides for rehabilitation where the renewed vitality of the

TABLE II-10

AVIATION INFRASTRUCTURE NEEDS

($ MILLIONS)

YEAR	83	84	85	83-85	86-90	91-2000	18 YEAR TOTAL
RDU,CLT, GSO	53.40	53.40	53.40	160.20	90.00	148.00	398.20
OTHER AIRPORTS	27.60	27.60	27.60	82.80	48.00	74.00	204.80
TOTAL	81.00	81.00	81.00	243.00	138.00	222.00	603.00
STATE SHARE	32.90	32.90	32.90	98.70	23.50	17.50	139.70

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

line would be probable, for $19.5 million. The option corresponding to the present level of funding is Condition IV, which would allow only limited rehabilitation where abandonment "will have substantial adverse impact on rail users." Total state cost would be $2.8 million.

If the Commission's proposal of Condition III as the most appropriate level of need is accepted, then current funding levels of $100,000 annually will produce a $17.7 million shortfall by 2000 ($19.5 million projected state share minus $1.8 million projected at current funding level). Table II-11 summarizes the Commission's findings for railroads.

When the shortfalls for public transit, aviation, and railroad funding are combined, the total shortfall over the 18-year period is $182.8 million.

Port Facilities

Port facilities are not a part of the N.C. Department of Transportation, but are the responsibility of the N.C. Port Authority. Information about capital improvement requirements is unavailable at the time of this writing.

TABLE II-11

RAILROAD INFRASTRUCTURE NEEDS

($ MILLIONS)

CONDITION	BACKLOG	83-85	86-90	91-2000	18 YEAR TOTAL
I	4.14	16.26	28.51	67.16	116.07
II	1.85	12.55	21.36	47.93	83.68
III	1.33	9.48	14.51	29.01	54.33
IV	0.00	3.75	6.25	12.50	22.50

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

RECOMMENDED STATE SHARE

($ MILLIONS)

CONDITION	BACKLOG	83-85	86-90	91-2000	18 YEAR TOTAL
I	2.14	7.02	12.36	30.18	51.70
II	0.97	5.07	8.69	20.10	34.83
III	0.70	3.47	5.10	10.20	19.46
IV	0.00	0.46	0.77	1.55	2.79

SOURCE : REPORT OF THE GOVERNOR'S BLUE RIBBON COMMISSION

CHAPTER III

DRINKING WATER SUPPLY

Background

In general, North Carolina has a sufficient, if not abundant, supply of high quality water. Yet the state's growing population, continued industrial development, and dispersed settlement pattern will place increasing pressure upon the state's water resources. By the year 2000 North Carolina's water use will double the estimated consumption in 1970.

Unfortunately there is no single state government agency that is responsible for water supply planning, nor is there a comprehensive study of the state's needs beyond the year 1987. The major sources of information for this study have been officials in the state's Department of Natural Resources and Community Development and Department of Human Resources (which share jurisdiction over state water needs), an unpublished 1981 survey of water system needs conducted by the Department of Human Resources' Division of Health Services, and the NC 2000 Report.

Table III-1 shows funding trends for water supply over the past ten years at the federal and state levels. There is no single large source of federal water monies available corresponding to the section 201 EPA wastewater funding. Rural areas may qualify for loans or grants from the Farmer's Home Administration, Community Development Block Grant money may be used for water supply projects, and some Economic Development Administration funding is available for water supply.

Since 1972 North Carolina state government has provided

TABLE III-1

FEDERAL AND STATE
WATER SUPPLY FUNDING

($ MILLIONS)

	FEDERAL			STATE	
YEAR	FMHA*	EDA	CDBG**	CWB***	TOTAL
1973	0.73	3.16	----	4.12	8.01
1974	0.80	2.16	----	23.37	26.33
1975	4.27	2.53	1.95	15.70	24.46
1976	10.93	5.17	2.10	12.03	30.23
1977	10.00	0.66	1.90	13.49	26.05
1978	7.40	0.58	2.15	24.23	34.36
1979	8.87	3.32	1.95	23.68	37.82
1980	10.13	2.77	2.00	19.66	34.56
1981	7.40	1.55	1.95	20.86	31.76
1982	3.40	0.84	1.70	26.06	32.00
TOTAL	63.93	22.74	15.70	183.20	285.58

SOURCES : NORTH CAROLINA DEPARTMENT OF NATURAL
RESOURCES AND COMMUNITY DEVELOPMENT,
FARMER'S HOME ADMINISTRATION,
NORTH CAROLINA DEPARTMENT OF COMMERCE

* ESTIMATE BASED UPON THE ASSUMPTION THAT 67% OF FMHA WATER AND WASTEWATER GRANTS ARE USED FOR WATER SUPPLY

** ESTIMATE BASED UPON THE ASSUMPTIONS THAT THE PERCENTAGE OF NORTH CAROLINA CDBG MONEY USED FOR WATER AND WASTEWATER PROJECTS IS EQUAL TO THE NATIONAL PERCENTAGE, AND THAT THE FUNDS ARE DIVIDED EQUALLY BETWEEN WATER AND WASTEWATER PROJECTS

*** ACTUAL TOTAL IS $185 MILLION, WHICH IS NOT REACHED DUE TO ADMINISTRATIVE COSTS AND ACCOUNTING METHODS

funding for up to 25 percent of the total cost of local water supply projects through the 1971 and 1977 Clean Water Bond Acts. The 1971 Act approved $75 million for water supply funding, along with $75 million in wastewater funding. In 1977 the second Act provided an additional $110 million in water funding. Out of 1263 applications for state water funds since 1972, 1009 received funding, and the total cost of these projects exceeded $400 million. All funds allocated to water supply from these bonds have been committed.

In 1981 the state legislature approved a third Clean Water Bond Act for $300 million, of which about $100 million would be used to fund water supply projects. Before being used, these bonds must be approved in a state-wide referendum called by the Governor, and to-date the Governor has judged that voter support would not be sufficient for passage of such a referendum.

Of the local share of water project funding, state officials estimate that 90 to 95 percent is provided by (local) general obligation bonds. In North Carolina the Local Government Commission must approve all local bond issues. This has resulted in stricter control of local bonds than in most other states, giving North Carolina municipalities generally high credit ratings and generally lower bond interest rates than comparable cities in other states. Over the last 10 years a total of $433 million in local water bonds have been issued in North Carolina. See Table III-2.

Existing Conditions

In North Carolina the supply of safe drinking water has been

TABLE III-2

LOCAL WATER BONDS
PROPOSED AND APPROVED

($ MILLIONS)

	COUNTIES		DISTRICTS, CITIES, TOWNS		STATEWIDE TOTALS			
YEAR	PROPSD	APPRVD	PROPSD	APPRVD	PROPSD	APPRVD	% CHG	% APVD
1973	2.00	2.00	27.01	27.01	29.01	29.01	---	100
1974	22.85	16.85	44.39	41.77	67.24	58.62	102	87
1975	47.46	12.66	21.41	15.89	68.87	28.55	-51	41
1976	12.35	12.35	20.48	20.48	32.83	32.83	15	100
1977	21.98	5.48	27.74	22.92	49.72	28.40	-14	57
1978	5.50	5.50	24.92	24.89	30.42	30.39	7	100
1979	20.52	19.10	60.40	53.15	80.92	72.25	138	89
1980	12.65	8.40	30.54	16.21	43.19	24.61	-66	57
1981	13.50	2.00	61.14	60.96	74.64	62.96	156	84
1982	45.40	45.40	20.11	20.11	65.51	65.51	4	100
TOTAL 1973-82	204.21	129.74	338.14	303.39	542.35	433.13	---	---
AVERAGE 1973-82	20.42	12.97	33.81	30.34	54.24	43.31	32.32	81.63

SOURCE : NORTH CAROLINA LOCAL GOVERNMENT COMMISSION

primarily a local responsibility with only limited regional or river basin planning. One result has been a proliferation of small water systems. There are 10,000-12,000 public water supply systems, most of which are tiny, serving a church or recreation center for example, or other facility that serves the public. Two thousand and fifty-eight are community water supply systems that have at least 15 connections and serve people on a year-around basis. Four hundred and twenty -seven are municipal systems but only about fifty have five hundred or more customers and only about ten serve more than 10,000 people.

Aside from the inefficiencies of the large number of small systems, an increasing number of systems are reaching their treatment capacity. Of the 427 municipal water supply systems, 37 are currently operating at peak capacity, and there is a current deficit in treatment capacity of 12 million gallons per day. Existing and future water system capacity deficits are summarized in Table III-3. Although raw storage capacity is not as limited as treatment capacity, a 1980 survey showed that a number of municipal systems in the Piedmont region are approaching the limits of their present water supply watershed capacities.

Capital Investment Needed

By the year 1990 demand will reach or exceed capacity for an additional 38 systems, and by 2000 the total number of systems at or beyond capacity will total 96, with a total treatment deficit of 117.1 million gallons per day. (See Table III-3.)
The Department of Human Resources 1981 survey estimated that

TABLE III-3

SUMMARIES OF THE NUMBER OF PUBLIC WATER SUPPLY SYSTEMS WHERE EXISTING OR PROJECTED AVERAGE DAILY WATER USE EXCEEDS EXISTING TREATMENT CAPACITY

	Geographic Area of the State Where Situtation Occurs or is Projected to Occur			
	Mountains	Piedmont	Coastal Plain	Statewide
Average Daily Use Exceeds Treatment Capacity				
Presently (Use already meets or exceeds)	8	14	15	37
Additional systems, 1982-1990	(11)	(24)	(3)	(38)
Total by 1990	19	38	18	75
Additional systems, 1990-2000	(7)	(12)	(2)	(21)
Total number of systems by the year 2000	26	50	20	96
Deficits in Treatment Capacity (in millions of gallons per day)				
Presently	5.4	3.1	3.5	12.0
By 1990	8.2	37.3	11.5	57.0
By 2000	19.7	84.5	12.9	117.1

total statewide water needs for the years 1983 to 1987 would reach $640 million. Corresponding dollar estimates for the years beyond 1987 are not available. Assuming that approximately 30% of the 1983-1987 needs are backlog needs, we can estimate that $183 million of the $640 million represents current needs, while the remainder represents annual needs of $91 million. If annual needs remain at this level, total year 2000 water supply needs for North Carolina will be 1.829 billion dollars. Although this is a very rough estimate, no more reliable figure is available.

Future Revenue Estimates

At the federal level it seems likely that the recently enacted cuts in water funding will not be reversed. If federal water funding from the Farmer's Home Administration, the Economic Development Agency, and Community Development Block Grants remains at current levels, during the next 18 years North Carolina will receive a total of $107 million. A summary of future revenue estimates for federal funding and required state and local matching funds are shown in Table III-4. The state and local governments of North Carolina would require $48 million in matching funds to fully use all the projected federal funds. If the state government assumes one-half of the non-federal share, as it has in the past, it would have to raise $24 million. Local governments would be required to raise the other $24 million.

At the state level the future of the 1981 Clean Water Bond Act is still uncertain. However, if North Carolina continues local water project funding along the trend established since 1971, a total of $419 million should be available over the next

TABLE III-4

WATER SUPPLY REVENUE REQUIREMENTS
FEDERALLY BASED APPROACH
1983-2000

($ MILLIONS)

GRANT	MATCH*	$ FED	$ STATE	$ LOCAL	ANNUAL $ TOTAL	18 YEAR $ TOTAL	% TOTAL
FMHA CWB	50-75% 12-25%	3.40	0.91	0.91	5.21	93.84	60.67
EDA CWB	50-80% 10-25%	0.84	0.42	0.42	1.68	30.24	19.55
CDBG	100%	1.70	0.00	0.00	1.70	30.60	19.78
ANNUAL $ TOTAL		5.94	1.33	1.33	8.59	154.68	100.00
18 YEAR $ TOTAL		106.92	23.88	23.88	154.68		
% TOTAL		69.12	15.44	15.44	100.00		

SUMMARY
$ NEEDS 1983-2000
1829.00
$ REVENUE 1983-2000
154.68
$ GAP 1983-2000
1674.32

SOURCE : NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

* PERCENTAGES IN THIS COLUMN INDICATE RANGES FOR THE PROPORTION OF PROJECT COSTS PAID BY FARMERS HOME ADMINISTRATION AND ECONOMIC DEVELOPMENT ADMINISTRATION GRANTS. THE CLEAN WATER BOND PERCENTAGES REFLECT THE STATE'S POLICY OF PROVIDING ONE-HALF OF THE NON-FEDERAL SHARE ON PROJECTS IN WHICH FEDERAL GRANT MONIES ARE USED.

18 years. Table III-5 summarizes future estimated state funding and the required local share, $1.256 billion, assuming that the state requires 75 percent sharing by the local government.

Over the last 12 years local bond funding of water supply projects has shown an upward trend, even after correcting for inflation. If this trend continues, local governments will raise a total of $1.085 billion in bond funding for water supply. If the upward trend does not continue and annual future revenues equal the annual average for the last ten years ($43.3 million), the 18 year total raised by local governments for water supply will be only $780 million.

As Table III-6 shows, the overall result (assuming the upward trend in local and state funding) is $1.685 billion in total water supply revenues, $144 million less than the $1.829 billion in total needs. Thus, a long- term revenue shortfall exists but is not overwhelming, assuming that recent trends continue in federal, state, and local government funding, and this is a big "if."

TABLE III-5

WATER SUPPLY REVENUE REQUIREMENTS
STATE BASED FUNDING
1983-2000

($ MILLIONS)

GRANT	MATCH	$ FED	$ STATE	$ LOCAL	$ TOTAL
CWB	25%				
LOCAL	75%	0.00	23.25	69.76	93.02
(ANNUAL)					
TOTAL		0.00	418.58	1255.74	1674.32
(18 YEAR)					
% TOTAL		0.00	25.00	75.00	100.00

SOURCE : NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

TABLE III-6

WATER SUPPLY
SUMMARY OF REQUIRED
AND PROJECTED FUNDING
1983-2000

($ MILLIONS)

CATEGORY	$ FED	$ STATE	$ LOCAL	18 YEAR $ TOTAL
REQUIRED $ TOTAL	106.92	442.46	1279.62	1829.00
% TOTAL	5.85	24.19	69.96	100.00
PROJECTED REVENUE*	106.92	493.23	1085.31	1685.46
$ GAP	0.00	-50.77	194.31	143.54
% GAP	0.00	-11.47	15.18	7.85

* PROJECTED REVENUES ASSUME THE CONTINUATION OF FEDERAL FUNDING AT THE LEVEL OF 1982, THE CONTINUATION OF STATE FUNDING (IN CLEAN WATER BONDS OR EQUIVALENT) AT THE LEVELS OF 1973-1982, AND LOCAL FUNDING AT THE LEVELS OF 1971-1982

CHAPTER IV

WASTEWATER COLLECTION & TREATMENT

Background

The Federal Water Pollution Control Act Amendments of 1972 declared that all the country's waters should be suitable for swimming and fishing by the year 1983. It is clear that North Carolina will not meet that goal. Although enormous progress has been made, almost 50 percent of the state's municipal wastewater treatment facilities have not met federal water quality standards, and there are development moratoria in more than 100 North Carolina towns because of inadequate waste treatment plants.

As in other states the provision of wastewater collection and treatment services is primarily a local responsibility. Since the federal Clean Water Act Ammendments of 1972, federal money has been available for the construction of local wastewater systems, up to 75 percent of the project cost. Through bonds financed by the state of North Carolina additional state funding has paid for one-half of the non-federal share of wastewater projects. Thus, since 1972 the majority of wastewater facilities have been funded by a 75 percent federal share, a 12.5 percent state share, and a 12.5 percent local share.

The assessment of wastewater needs in this report is taken from the EPA 1982 Needs Survey of wastewater needs, which is based upon statewide surveys of local system needs through the year 2000. The EPA survey is updated every two years.

Table IV-1 shows the levels of federal and state funding for

TABLE IV-1

FEDERAL AND STATE
WASTEWATER FUNDING

($ MILLIONS)

	FEDERAL				STATE	
YEAR	EPA 201	FMHA*	EDA	CDBG**	CWB	TOTAL
1973	18.50	0.37	.24	----	9.96	29.07
1974	27.70	0.40	.132	----	12.81	41.04
1975	70.50	2.13	0.46	1.95	8.81	83.85
1976	110.30	5.47	0.22	2.10	13.38	131.47
1977	52.60	5.00	0.88	1.90	16.51	76.88
1978	89.10	3.70	0.08	2.15	20.80	115.83
1979	82.00	4.43	1.24	1.95	16.09	105.72
1980	37.90	5.07	0.01	2.00	16.78	61.76
1981	47.80	3.70	1.75	1.95	17.86	73.06
1982	46.30	1.70	0.00	1.70	21.66	71.36
TOTAL	582.70	31.97	5.02	15.70	154.65	790.03

SOURCES : NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT, FARMER'S HOME ADMINISTRATION, NORTH CAROLINA DEPARTMENT OF COMMERCE

* ESTIMATE BASED UPON THE ASSUMPTION THAT 33% OF FMHA WATER AND WASTEWATER GRANTS ARE USED FOR WASTEWATER PROJECTS

** ESTIMATE BASED UPON THE ASSUMPTIONS THAT THE PERCENTAGE OF NORTH CAROLINA CDBG MONEY USED FOR WATER AND WASTEWATER PROJECTS IS EQUAL TO THE NATIONAL PERCENTAGE, AND THAT THE FUNDS ARE DIVIDED EQUALLY BETWEEN WATER AND WASTEWATER PROJECTS

wastewater construction from 1973 to 1982. There are four sources of federal funds. The largest contribution, by far, has been EPA section 201 money. Smaller sums of federal aid have been available from the Farmer's Home Administration (for rural projects), the Economic Development Administration (for economic development), and through Community Development Block Grants. In 1980 section 201 funds were cut roughly in half, and state officials expect federal funding to stay at this reduced level.

State funding has been provided by the Clean Water Bond Acts of 1971 and 1977. In 1981 the state legislature approved a third Clean Water Bond Act to provide $300 million in water and sewer funds, of which about $195 million would be utilized for wastewater. The Act requires that the bonds be approved in a state-wide referendum. The Governor has not established a date for the referendum, judging until now that voter support would be insufficient for passage.

Information on total local expenditures is not available, but state officials estimate that over 90 percent of local wastewater facilities funding is provided by local bonds. Table IV-2 lists the total amount of local wastewater bonds approved and rejected by voters from 1973 to 1982.

Existing Conditions

Nearly 50 percent of municipal treatment facilities, and almost 90 percent of industrial wastewater sources, fail to meet federal water quality standards. As determined by the EPA there is a backlog of current needs of $1.07 billion in the state. Table IV-3 divides these needs into categories, and shows total

TABLE IV-2

LOCAL SEWER BONDS
PROPOSED AND APPROVED

($ MILLIONS)

	COUNTIES		DISTRICTS, CITIES, TOWNS		STATEWIDE TOTALS			
YEAR	PROPSD	APPRVD	PROPSD	APPRVD	PROPSD	APPRVD	% CHG	% APVD
1973	0.00	0.00	29.42	28.77	29.42	28.77	---	98
1974	6.85	4.85	12.85	12.85	19.70	17.70	-39	90
1975	0.00	0.00	3.62	3.62	3.62	3.62	-80	100
1976	0.00	0.00	13.23	12.98	13.23	12.98	259	98
1977	0.00	0.00	46.79	35.09	46.79	35.09	170	75
1978	0.00	0.00	25.88	25.51	25.88	25.51	-27	99
1979	13.68	3.88	36.52	32.77	50.20	36.65	44	73
1980	0.00	0.00	36.91	35.33	36.91	35.33	-4	96
1981	0.43	0.43	30.32	28.46	30.75	28.88	-18	94
1982	0.23	0.23	18.06	16.52	18.29	16.75	-42	92
TOTAL 1973-82	21.19	9.39	253.59	231.89	274.78	241.27	---	---
AVERAGE 1973-82	2.12	0.94	25.36	23.19	27.48	24.13	29.27	91.35

SOURCE : NORTH CAROLINA LOCAL GOVERNMENT COMMISSION

TABLE IV-3

CURRENT WASTEWATER NEEDS

($ MILLIONS)

AREA	TREATMENT			CORRECTION		CONSTRUCTION		TOTAL
	SECONDARY	ADVANCED	ADVANCED SECONDARY	REPL & REHABIL	COMBIN OVERFLOW	NEW COLLCTRS	NEW INTCPTRS	
NORTH CAROLINA	300	94	32	84	2	404	151	1067
PERCENT OF STATE NEEDS	28.12	8.81	3.00	7.87	0.19	37.86	14.15	100.00
UNITED STATES	20137	3245	528	7241	35739	16769	8933	92592
PERCENT OF U.S. NEEDS	21.75	3.50	0.57	7.82	38.60	18.11	9.65	100.00
N.C. NEEDS AS PERCENT OF U.S. NEEDS	1.49	2.90	6.06	1.16	0.01	2.41	1.69	1.15

SOURCE : EPA 1982 NEEDS SURVEY

national needs for comparison. The total dollar needs for each state are influenced by regional construction cost multipliers. North Carolina is in a region with the lowest sewer construction multiplier in the country, and one of the lowest treatment plant multipliers. Thus while North Carolina's population is 2.6 percent of the national population, the state's sewer needs according to the EPA formula represent only 1.15 percent of the national total.

Capital Investment Needed

Table IV-4 lists North Carolina wastewater needs through the year 2000, as determined by the EPA, a total of $1.774 billion (including the $1.07 billion backlog). The greatest proportions of these needs are for new collectors (branch lines), new interceptors (trunk lines), and secondary treatment facilities. By the year 2000 the state's growing population is expected to be 2.8 percent of the national total, yet North Carolina accounts for only 1.5 percent of the total national wastewater capital improvement needs. This is due to the lower construction cost index in the state and the fact that North Carolina has less need than the U.S. average for corrective capital investment. Compared to the U.S., North Carolina's needs are more focused on catching up to demand for system expansion of new collectors, new interceptors, and improved treatment.

Future Revenue Estimates

Tables IV-5, IV-6 and IV-7 project future resources for financing wastewater infrastructure needs through the year 2000.

TABLE IV-4

YEAR 2000 WASTEWATER NEEDS
(INCLUDES CURRENT NEEDS)

($ MILLIONS)

	TREATMENT			CORRECTION		CONSTRUCTION		
AREA	SECONDARY	ADVANCED	ADVANCED SECONDARY	REPL & REHABIL	COMBIN OVERFLOW	NEW COLLCTRS	NEW INTCPTRS	TOTAL
NORTH CAROLINA	448	124	40	87	2	509	564	1774
PERCENT OF STATE NEEDS	25.25	6.99	2.25	4.90	0.11	28.69	31.79	100.00
UNITED STATES	31134	4871	873	7249	35739	20664	17830	118360
PERCENT OF U.S. NEEDS	26.30	4.12	0.74	6.12	30.20	17.46	15.06	100.00
N.C. NEEDS AS PERCENT OF U.S. NEEDS	1.44	2.55	4.58	1.20	0.01	2.46	3.16	1.50

SOURCE : EPA 1982 NEEDS SURVEY

TABLE IV-5

WASTEWATER REVENUE REQUIREMENTS
FEDERALLY BASED APPROACH
1983-2000

($ MILLIONS)

GRANT	MATCH*	$ FED	$ STATE	$ LOCAL	ANNUAL $ TOTAL	18 YEAR $ TOTAL	% TOTAL
PRE-1985 EPA 201 CWB	75% 25%	46.30	7.72	7.72	61.73	123.47	7.90
POST-1985 EPA 201 CWB	55% 45%	46.30	18.94	18.94	84.18	1346.91	86.22
FMHA CWB	50-75%	1.70	0.85	0.85	3.40	61.20	3.92
EDA CWB	50-80% 10-25%	0.00	0.00	0.00	0.00	0.00	0.00
CDBG	100%	1.70	0.00	0.00	1.70	30.60	1.96
PRE-1985 ANNUAL $ TOTAL		49.70	8.57	8.57	66.83	133.67	8.56
POST-1985 ANNUAL $ TOTAL		49.70	19.79	19.79	89.28	1428.51	91.44
18 YEAR $ TOTAL		894.60	333.79	333.79		1562.18	100.00
% TOTAL		57.27	21.37	21.37		100.00	

SUMMARY
$ NEEDS 1983-2000
1774.00
$ REVENUE 1983-2000
1562.18
$ GAP 1983-2000
211.82

SOURCE : NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

* PERCENTAGES IN THIS COLUMN INDICATE RANGES FOR THE PROPORTION OF PROJECT COSTS PAID FOR PROJECTS WHICH QUALIFY FOR ENVIRONMENTAL PROTECTION AGENCY SECTION 201 FUNDING, AND FARMERS HOME ADMINISTRATION AND ECONOMIC DEVELOPMENT ADMINISTRATION GRANTS. THE CLEAN WATER BOND PERCENTAGES REFLECT THE STATE'S POLICY OF PROVIDING ONE-HALF OF THE NON-FEDERAL SHARE ON PROJECTS IN WHICH FEDERAL GRANT MONIES ARE USED.

TABLE IV-6

WASTEWATER REVENUE REQUIREMENTS
STATE BASED FUNDING
1983-2000

($ MILLIONS)

GRANT	MATCH	$ FED	$ STATE	$ LOCAL	$ TOTAL
CWB	25%				
LOCAL (ANNUAL)	75%	0.00	2.94	8.83	11.77
TOTAL (18 YEAR)		0.00	52.96	158.87	211.82
% TOTAL		0.00	25.00	75.00	100.00

SOURCE : NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

TABLE IV-7

WASTEWATER
SUMMARY OF REQUIRED
AND PROJECTED FUNDING
1983-2000

($ MILLIONS)

CATEGORY	$ FED	$ STATE	$ LOCAL	18 YEAR $ TOTAL
REQUIRED $ TOTAL	894.60	386.74	492.66	1774.00
% TOTAL	50.43	21.80	27.77	100.00
PROJECTED REVENUE*	894.60	369.87	369.47	1633.94
$ GAP	0.00	16.87	123.19	140.06
% GAP	0.00	4.36	25.00	7.90

* PROJECTED REVENUES ASSUME THE CONTINUATION OF FEDERAL FUNDING AT THE LEVEL OF 1982, THE CONTINUATION OF STATE FUNDING (IN CLEAN WATER BONDS OR EQUIVALANT) AT THE LEVELS OF 1973-1982, AND LOCAL FUNDING AT THE LEVELS OF 1971-1982. IN ADDITION, THE LOCAL FUNDING PROJECTION ASSUMES THAT FUTURE REVENUES WILL NOT DROP BELOW A FLOOR AT THE LEVEL OF 1982.

There are difficulties and large assumptions involved at all levels -- federal, state, and local.

It is extremely difficult to project how much Section 201 funding will be available, or to estimate FmHA, EDA, or, CDBG funds which may be spent on wastewater facilities. In 1985 two major changes in the distribution of Section 201 funding will take place. The federal govenment will reduce its maximum level of funding from 75 to 55 percent of a project's cost. This does not necessarily involve a reduction in total federal funding, rather it signifies a desire to increase state and local financial responsibility in the funding of a greater level of investment. Second, federal money will be available only for upgrading treatment at current flow levels. Expansion of capacity will no longer qualify for EPA federal funding.

Table IV-5 shows the estimated future revenue needs for wastewater capital expenditures for state and local government, based on estimates of future levels of the several types of federal monies and their associated matching formula requirements. We might call this "a federal program-driven" projection. It assumes that state and local governments will raise sufficient revenues to take full advantage of available federal grants on a matching basis. It is assumed that the state and local levels of government will split 50-50 on the responsibility to raise the non-federal share. As shown in Table IV-5, over the next 18 years North Carolina can expect to receive $895 million in federal wastewater funding, if the current level of funding remains constant. To secure that money the state and local government must each contribute $334 million, for a total

of $1.562 billion in wastewater projects in which the federal government participates. Under the assumptions utilized in the table, the federal government will provide 57 percent of the revenues for wastewater capital expenditures over the 18 year period. The state and local governments would each raise over 21 percent. A gap of $212 million remains between needs ($1.774 billion) and revenues ($1.562 billion).If the assumptions are not met, the gap will be much larger. The size of the shortfall is of course heavily dependent upon (1) continued state funding of the type provided in the past through Clear Water Bonds, (2) local funding to match federal and state monies, and (3) federal funding at current levels.

At the state level, voter approval of the $300 million in clean water bonds is far from certain. In addition, a bill currently in the General Assembly would increase the state sales tax and require that municipalities designate at least 40 percent of the extra revenue for water and wastewater grants, at least for the first five years. Passage of this bill would alter the means of state water and wastewater financing from special bonds to direct appropriations from the General Fund. In the past the state has granted wastewater construction money only to projects that received federal funding. With the cutback in federal money, North Carolina will likely allow local, non-federally funded projects to receive state grants for 25 percent of the total project cost. If the state pays 25 percent of the $212 million gap, the total state share of wastewater funding needs would be $387 million ($334 million in federal participation projects, and $53 million in non-federal projects) as Tables

IV-5, IV-6 and IV-7 demonstrate.

Exploring an alternative approach to projecting revenues for capital expenditures, a trend line was fit to past state government wastewater expenditures (for 1971 to 1982) and the line extrapolated to the year 2000. The resulting projection totaled $370 million (in 1982 dollars) for state level wastewater funding from 1983 to 2000. In other words, the present level of state funding is almost sufficient to meet projected needs if Clean Water Bonds (or equivilant funding sources) continue to be available as they have in the past. To meet this funding need, and if one assumed that two-thirds of any Clean Water Bonds would be allocated to wastewater and one-third to water supply as it is for the 300 million Clean Water Bond Act of 1981, North Carolina would need to obtain voter approval for the 1981 Act and another of equal size between now and the year 1990. This level of funding is substantial and certainly cannot be assumed as a given.

Local governments have had increasing difficulty gaining voter approval for local bond issues. Future years may see more use of alternate financing means of water and sewer improvements, such as leasing services from private contractors or financing capital improvements by setting aside a portion of current revenues. If North Carolina local governments are going to raise the necessary funds to match all the state and federal wastewater money available, they will need $493 million over the next 18 years. (See top row of Table IV-7.)

The extrapolation of a trend line fit to past local sewer bond expenditures projects that $332 million will be raised in

local bonds from 1983 to 2000. If sewer bonds continue to constitute 90 percent of local capital investment in wastewater facilities, local governments would raise a total of $369 million. This would indicate that local funding at the level projected by continuation of past trends will fall 25 percent short of projected funding needs.

Thus if present federal, state, and local wastewater funding trends continue, there will be insufficient funds to meet needs. The shortfall of 140 million is about 8 percent of total needs, and almost all of it is at the local level. Table IV-7 summarizes these findings.

One reason the deficiency is not greater is the large proportion of overall needs which is classified as backlog, or current, needs. Of the $1.774 billion total needs, $1.07 billion (over 60 percent) is backlog. Current funding levels are high because of that. As the backlog is gradually eliminated the need for new funding will drop as well.

CHAPTER V

EXECUTIVE SUMMARY

Contextual Factors

The number of people in North Carolina is expected to grow by 17 to 25 percent by the year 2000 to a population of between 6.8 and 7.3 million people. Thus the state's infrastructure will have to support between 900,000 and 1.4 million more people, or up to half a million more households.

Nonfarm employment is expected to increase by 47 percent by 2000, over 1980 employment, about twice the rate of population growth. The existence of adequate public infratstructure and a sound program for maintaining and expanding it will be a factor in influencing the level and location of the major private sector economic development and investment decisions, and vice versa.

While the state is now predominantly rural and small town in nature, that pattern is changing to one of increasing urbanization. This may create infrastructure needs that are greater in proportion to the population and economic activity than is the case with the current rural and small town pattern where water and sewer are often provided privately by both industry and residences.

State government's capital expenditures have averaged $368 million dollars per year over the past decade, about 9 percent of the total state budget. However, capital expenditures were only 6.7 percent of the state budget in the current fiscal year, 1983, and are projected to be below 6 percent of the total state budget for fiscal years 1984 and 1985. If the proposed sales tax

increase is instituted by the current legislature, it will substitute for the traditional state participation in water, sewer, and school facility improvements through state bonds which have been distributed to local governments through grants. Thus, state capital investments would decrease to an even smaller proportion of the total budget than 6 percent.

It is fairly clear that something must be done, however, whether it be a sales tax increase or further state bond authorizations and referenda. Of the major state level bond authorization acts, none has significant monies remaining and the state has provided no new bond money sources since the Clean Water Bond and Highway Bond Acts of 1977. Action on two major bond proposals since 1977 has been postponed, although the state's gasoline tax was increased to provide more highway funds.

Compared to other states, North Carolina's capacity to raise revenues is low. It ranks 42nd to 45th among the states in revenue raising capacity. On the other hand, North Carolina's state and local tax effort, even relative to its low revenue base, is also below the U.S. average. Thus, the state generates very low revenues, compared to the national average.

Assuming that projections of the state's total personal income are reasonable, and that past relationships between personal income, total state government expenditures, and capital expenditures continue, between $8.46 billion and $12.74 billion should be available for capital expenditures by state government for the 18 year period from 1983 to the year 2000.

North Carolina's state government does no overall, systematic capital improvement planning or programming. What

planning is accomplished is done by individual agencies with little or no overall coordination.

Transportation--Highways

The majority of highway investment will involve upgrading of existing roads, not building brand new ones. The state's so-called "basic" construction program, "representing the minimum level of sevice which ultimately should be considered in a long term highway program," would cost $13.9 billion in 1982 dollars over the eighteen year projection period. A more "desirable" program would cost $18.9 billion.

Maintenance alone will require $222 million per year over the long term. For the next several years, gradual reduction of the maintenance backlog in contract resurfacing will require more than that,at least $262 per year. Over the next 18 years, highway maintenance will cost $4 billion, almost 30 percent of the total "basic" program.

Total projected highway fund revenues for the eighteen year projection period is $13.8 billion. Approximately 40 percent would come from the state's gas tax and 35 percent from federal funds. The remainder would come from license plates, driver's licenses, and other fees.

The implied shortfall between the estimated $13.9 billion cost of the "basic" program and the $13.8 billion revenue estimate is $130 million. The shortfall for the "desirable" program is $5.15 billion.

The projection of total highway program revenues of $13.8 billion is contingent upon the state receiving its full share of

projected federal funds. In 1982-83 the state was able to receive its full share only by utilizing the last of the 1977 Highway Bond money. For the 1983-84 fiscal year, there will be a $27.5 million deficiency in state matching funds, increasing to $29.5 million in 1984-85. This will mean a loss of well over $100 million per year in federal funds unless revenue sources are found to provide matching funds. At present there is no consensus about how the state should secure the additional funding to take full advantage of federal monies for highway improvements, although the legislature has passed some license fee increases.

If (1) the projected Highway Fund revenues in the The Report of the Governor's Blue Ribbon Commission on Transportation Needs and Financing are accurate, (2) the state is able to raise enough money to secure all the federal matching funds available, and (3) inflation does not become a major factor, then North Carolina faces an 18-year cumulative shortfall of $125 million in funding the "basic" program, or a substantially greater $5 billion shortfall in funding the "desirable" program. With only 3 percent inflation, the "basic" shortfall would be over four billion dollars, and the shortfall for the "desirable" program would top ten billion. With six percent inflation, the figures become ten and twenty billion dollars of shortfall.

The highway program confronts a basic dilemma. The major source of state revenue is the gas tax, which is projected to remain relatively constant because the tax is an absolute amount (12 cents) on each gallon consumed. As miles per gallon increases for automobiles, contributions to the highway fund tend

to hold relatively constant, even with increasing total milage. Thus, there is no responsiveness to inflationary rises in prices. Costs of building and maintaining the highway system, however, do rise dramatically with inflation. Thus, the major revenue source for highway improvements is constrained while the cost side and perhaps federal match-demanding funds escalate in times of inflation.

Transportation--Other

Public Transportation. The Governor's Blue Ribbon Commission recommends state funding for capital improvements to urban and rural public transportation systems to be $40 million over the 18-year period, mostly for vehicles. If present levels of actual funding for such capital improvements are continued, the state will be providing only $8.5 million, leading to a projected shortfall of $31-$32 million below the Commission's recommended level.

Aviation. The Commission's estimated need for capital improvements for aviation is $603 million for the 1983-2000 period. The N.C. Airport System plan recommends that state government share be $139.7 million. At the present level of funding, the state will generate ony $63 million, leaving a $76.7 million shortfall.

Railroads. The Blue Ribbon Commission recommends a plan that would provide state subsidy and rehabilitation monies "for lines where renewed vitality would be probable," at an estimated cost of $19.5 million to the state. Current level funding will provide only $1.8 million, leaving a $17.7 million shortfall.

Port Facilities. Ports are not a part of the N.C. Department of Transportation and information on capital improvement needs is not available at the time of this writing.

Drinking Water Supply

Water supply, to a much greater degree than highways or even wastewater treatment, is a local responsibilty.

Of the 427 municipal and county water supply systems in North Carolina, at least 37 are presently operating at peak capacity and there is a current deficit in treatment capacity of 12 million gallons per day. By the year 2000, the total number of municipal and county systems that are at or beyond capacity will total 96. Their total treatment capacity deficit will be 117 million gallons per day.

Water supply capital investment needs are projected to be $1.829 billion for the period 1983-2000. Projections of revenue are $1.685 billion, assuming current levels of federal monies and the trends of state and local government capital investments in water supply. Thus, a shortfall of $144 million is projected for the 18 year period. The shortfall is totally in the local government share. If local governments' expenditures for water supply improvements do not continue to increase and instead stays at the past 10-year average, the shortfall will increase to $444 million, again all at the local level.

Wastewater

Nearly 50 percent of municipal treatment facilities, and almost 90 percent of industrial wastewater sources, fail to meet

federal water quality standards.

There is an EPA estimated backlog of current capital investment needs of $1.07 billion for the state. Capital investment needs to the year 2000 total $1.774 billion (including the 1.07 billion dollar backlog.)

Projections of revenue for capital improvements total $1.634 billion, leaving an estimated $140 million shortfall. Most of the shortfall ($123 million of it) is at the local level.

Summary Table of Projected Needs, Revenues, and Shortfalls

Table V -1 summarizes the estimates of projected needs, revenues projected to be available for capital expenditures, and the resultant shortfall estimates for the period, 1983-2000. All estimates are in 1982 dollars. The functional categories for which the analyses were made are listed on the left side of the table.

Looking first at the totals in the bottom row of the table, we observe total estimated funding requirements to be $18.5 billion for public capital needs for the listed categories. If the desirable highway improvement program is followed rather than the basic (minimum) program, the total is $23.5 billion for the 18-year period.

Projected state government revenues over the same period, for the categories of capital improvements analyzed in the report, are $9.9 billion. The state government's share of the total capital expenditure needs are $10.1 billion. The estimated shortfall for the state level is therefore $213 million.

Projected local revenues for capital expenditures, based on

TABLE V -1
SUMMARY OF PROJECTED PUBLIC CAPITAL IMPROVEMENT EXPENDITURE REQUIREMENTS, REVENUES AND SHORTFALLS: 1983-2000
(IN BILLIONS OF 1982 DOLLARS)

Functional Category of Need	Projected Expenditure Requirements	Projected Revenues/(share of needs) for Capital Improvements				Shortfalls (surplus) Between Projected Needs and Projected Revenues		
		Federal	State	Local	Total Revenue	State	Local	Total
Transportation								
Highway, Basic Program	13.930	4.860	8.950/9.070	-	13.810	.120	-	.120
Desirable Program(1)	[18.860]	[4.860]	[8.950/14.000]	-	[13.810]	[5.150]	-	[5.150]
Public Transportation	.400	N.A.	.009/.040	N.A.	.009(7)	.031	N.A.	.031(7)
Aviation	.603	N.A.	.063/.140	N.A.	.063(7)	.077	N.A.	.077(7)
Railroads	.020(2)	-	.002/.020	-	.002	.018	-	.018
Water Supply	1.829	.107	.493/.442	1.085/1.280	1.685	(+.050)	.194	.144
Wastewater	1.774	.895	.370/.387	.369/.493	1.634	.017	.123	.140
Total	18.526	5.862(7)	9.887	1.454	17.203(7)	.213	.317(7)	.530

N.A.=not available; - = not applicable

(1) Only figures for the "basic" highway program are included in totals below; "desirable" program costs are included on this line for information purposes.
(2) State share only, does not include private capital investment needed.
(3) 5.580 is the total of $2.16 billion for maintenance and $3.42 billion for construction and renovation, $3.42 is the midpoint of the $3.12-3.72 billion range of projection.
(4) Assuming same shares of total estimated requirements among governmental levels as existed in the period 1971-81.
(5) Assuming the federal government meets its full traditional share--4.8% of requirements.
(6) Assumes the mid-point of the $623-763 million range projected in Chapter V.
(7) These figures do not include some federal and local revenue estimates that are not available; see appropriate row or column for N.A. symbol indicating the missing data.

trends, are $1.5 billion for water and sewer. Information for public transportation and aviation are not available. Local funding requirements are projected to be $4.8 billion, leaving a projected shortfall of $317 million.

The cumulative shortfall for state and local government in North Carolina is estimated to be $530 million. It would be $5.5 billion if the "desirable" highway program were implemented instead of the "basic" program.

It should be emphasized that all estimates are in 1982 dollars and are subject to considerable uncertainties involved in projecting funding requirements and revenues over so long a period and based only on already available information.